UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of FLORIDA POWER & LIGHT CO. (Turkey Point Nuclear Generating Units 6 and 7)	Docket Nos. 52-040-COL 52-041-COL

ORDER
(Setting Deadline for Proposed Transcript Corrections)

The Commission held an evidentiary hearing on December 12, 2017, at its Rockville, Maryland headquarters to receive testimony and exhibits in the uncontested portion of the captioned proceeding. The hearing transcript is appended to this Order. Pursuant to my authority under 10 C.F.R. § 2.346(a) and (j), the parties may file any proposed transcript corrections no later than January 9, 2018. The parties may coordinate their responses and file a joint set of corrections.

IT IS SO ORDERED.

For the Commission

NRC SEAL

/RA/
Annette L. Vietti-Cook
Secretary of the Commission

Dated at Rockville, Maryland,
this 18th day of December, 2017.

Official Transcript of Proceedings

NUCLEAR REGULATORY COMMISSION

Title: Hearing on Combined Licenses for Turkey Point, Units 6 and 7

Docket Number: (n/a)

Location: Rockville, Maryland

Date: Tuesday, December 12, 2017

Work Order No.: NRC-3428 Pages 1-190

NEAL R. GROSS AND CO., INC.
Court Reporters and Transcribers
1323 Rhode Island Avenue, N.W.
Washington, D.C. 20005
(202) 234-4433

UNITED STATES OF AMERICA

NUCLEAR REGULATORY COMMISSION

+ + + + +

HEARING ON COMBINED LICENSES FOR TURKEY POINT, UNITS 6 AND 7: SECTION 189A. OF THE ATOMIC ENERGY ACT PROCEEDING

+ + + + +

TUESDAY,

DECEMBER 12, 2017

+ + + + +

ROCKVILLE, MARYLAND

+ + + + +

The Commission met in the Commissioners' Hearing Room at the Nuclear Regulatory Commission, One White Flint North, 11555 Rockville Pike, at 9:03 a.m., Kristine L. Svinicki, Chairman, presiding.

COMMISSION MEMBERS:

KRISTINE L. SVINICKI, Chairman

JEFF BARAN, Commissioner

STEPHEN G. BURNS, Commissioner

ALSO PRESENT:

ANNETTE VIETTI-COOK, Secretary of the Commission

MARGARET DOANE, General Counsel

NRC STAFF:

FRANCIS AKSTULEWICZ, Director, Division of New Reactor Licensing, Office of New Reactors

MANNY COMAR, Senior Project Manager, Office of New Reactors

JENNIFER DIXON-HERRITY, Branch Chief, Licensing Branch 4, Office of New Reactors

PEYTON DOUB, Biologist, Office of New Reactors

JOSEPH GIACINTO, Hydrologist, Office of New Reactors

ZACHARY GRAN, Health Physicist, Office of New Reactors

MOHAMMAD HAQUE, Senior Hydrologist, Office of New Reactors

ANDREW KUGLER, Senior Project Manager, Office of New Reactors

DANIEL MUSSATTI, Office of New Reactors

VONNA ORDAZ, Deputy Director, Office of New Reactors

ELLEN SMITH, Hydrologist, Oak Ridge National Laboratory

SESHAGIRI TAMMARA, Office of New Reactors

ALICIA WILLIAMSON, Project Manager, Office of New Reactors

MEGAN A. WRIGHT, Counsel for NRC Staff

APPLICANT REPRESENTATIVES:

STEPHAN FRANZONE, Licensing Manager, Florida Power & Light Company

PAUL JACOBS, Engineering Supervisor, Florida Power & Light Company

ANNE LEIDICH, Counsel for Florida Power & Light Company Staff

WILLIAM MAHER, Senior Licensing Director, Florida Power & Light Company

MANO NAZAR, President, Nuclear Division and Chief Nuclear Officer, Florida Power & Light Company

RICHARD ORTHEN, Licensing Engineer, Florida Power & Light Company

CONTENTS

P R O C E E D I N G S

9:03 a.m.

CHAIRMAN SVINICKI: Good morning, everyone. I call this hearing to order and a good morning.

And, there's a wonderful number of people in the room and a great energy, so we're going to have a good hearing today.

I want to welcome the Applicant, Florida Power and Light, or FPL, the NRC staff, members of the public in the room with us and those who are observing remotely.

The Commission convenes today to conduct and evidentiary hearing on FPL's application for Combined Licenses to construct and operate two new nuclear power plants at the existing Turkey Point site in Miami-Dade County, Florida.

This hearing is required under Section 189(a) of the Atomic Energy Act of 1954 as amended.

The Commission will also be reviewing the adequacy of the NRC staff's environmental impact analysis under the National Environmental Policy Act of 1969, or NEPA.

The general order of today's hearing is as follows.

First, I will address procedural matters associated with the swearing in of witnesses and the admission into the record of the parties' exhibits.

FPL and the NRC staff will then provide testimony in witness panels that provide an overview of the application as well as address safety and environmental issues associated with its review, with Commission questions following each panel.

The Commission expects to issue a decision after the hearing promptly with due regard to the complexity of the issues after it makes the following necessary findings.

On the safety side, the Commission will determine, one, whether the applicable standards and requirements of the Atomic Energy Act and the Commission's regulations, specifically those in 10 CFR Section 52.97 have been met.

Two, whether any required notifications to other agencies or bodies have duly been -- been duly made.

Three, whether there is reasonable assurance that the facility will be constructed and will operate in conformity with the licenses, the provisions of the Atomic Energy Act and the NRC's regulations.

Four, whether the Applicant is technically and financially qualified to engage in the activities authorized.

And, five, whether issuance of the licenses would be inimical to the common defense and security or to the health and safety of the public.

On the environmental side, as noted in 10 CFR Section 51.07(a), the Commission will determine whether the requirements of the National Environmental Policy Act, Section 102(2)(a)© and (e) and the applicable regulations in 10 CFR Part 51 have been met.

Second, we will independently consider the final balance among conflicting factors contained in the record of the proceeding with a view to determining the appropriate action to be taken.

Third, we will determine, after weighing the environmental, economic, technical and other benefits against environmental and other costs and considering reasonable alternatives, whether the Combined Licenses should, on the basis of the environmental review be issued, denied or appropriately conditioned.

And, fourth, determine whether the NEPA review conducted by the NRC staff has been adequate.

This meeting is open to the public and we do not anticipate the need to close the meeting to discuss nonpublic information. If a party believes that the response to a question may require a reference to nonpublic information, then that party should answer the question to the extent practicable with information in the publically available record and file any nonpublic response promptly after the hearing on the nonpublic docket.

I will now ask my fellow Commissioners whether they have any opening remarks for today's mandatory hearing. We've done a few of these as a group.

(NO RESPONSE)

CHAIRMAN SVINICKI: So, okay.

So, we will now proceed to the swearing in of witnesses and we will begin with FPL. So, counsel for FPL, would you please introduce yourself?

MS. LEIDICH: I'm Anne Leidich with the firm Pillsbury Winthrop Shaw Pittman.

CHAIRMAN SVINICKI: I think you might have turned it off. Okay, thank you.

MS. LEIDICH: I'm Anne Leidich with the firm Pillsbury Winthrop Shaw Pittman and I have the pleasure of representing Florida Power and Light

Company.

CHAIRMAN SVINICKI: Thank you.

So, I would ask you now to read the names of FPL's witnesses and each witness should stand as her or his name is read and please remain standing.

MS. LEIDICH: Mano Nazar, William Maher, Stephan Franzone, Paul R. Jacobs and Richard F. Orthen.

CHAIRMAN SVINICKI: Okay, thank you.

I will ask you now to please raise your right hand while I read the oath.

Do you swear or affirm that the testimony you will provide in this proceeding is the truth, the whole truth and nothing but the truth?

(CHORUS OF I DO)

CHAIRMAN SVINICKI: Thank you.

Are there any witnesses of the witnesses standing who did not take the oath?

(NO RESPONSE)

CHAIRMAN SVINICKI: Hearing none. Are there any objections to including the witness list as part of the record?

MS. WRIGHT: None from staff.

CHAIRMAN SVINICKI: Okay, thank you.

In the absence of objections, the witness

list is admitted into the record and the witnesses may seat.

Thank you.

For FPL counsel, we will now turn to FPL's exhibits. Counsel, I would first ask, are there any changes to your exhibit list?

MS. LEIDICH: No, there are not.

CHAIRMAN SVINICKI: Please read the range of numbers of the exhibits to be admitted.

MS. LEIDICH: FPL-001 to FPL-010.

CHAIRMAN SVINICKI: Is there a motion to admit the exhibits into the record?

MS. LEIDICH: Yes, there is.

CHAIRMAN SVINICKI: Are there any objections to the admission of the exhibits and the exhibit list as part of the record?

MS. WRIGHT: No objections.

CHAIRMAN SVINICKI: In the absence of objections, the exhibits and exhibit list are admitted into the record.

I now turn to the NRC staff counsel for the presentation of the NRC staff's witnesses, counsel, please introduce yourself.

MS. WRIGHT: Hi, I'm Megan Wright, counsel for NRC staff. We have quite a bit more witnesses

than FPL.

CHAIRMAN SVINICKI: Those of us who have been here before understand this will take a little bit longer.

So, I will now ask NRC counsel to please read the names of the staff witnesses. Each witness should stand as her or his name is read and please remain standing.

MS. WRIGHT: Frank Akstulewicz, Clinton Ashley, Dan Barss, Laurel Bauer, Anthony Bowers, Lawrence Burkhart, Robert Caldwell, Anthony Campbell, Nan Chien, Manny Comar, Christopher Cook, David Curtis, Thinh Dinh, Jennifer Dixon-Herrity, Michael Dudek, Robert Fitzpatrick, John Frost, Joseph Giacinto, Zachary Gran, Michelle Hart, Brad Harvey, Shawn Harwell, David Heeszel, Shana Helton, John Honcharik, Diane Jackson, Kerri Kavanagh, Taylor Lamb, Tuan Le, Mark Lintz, Kosmas Lois, Timothy Lupold, Greg Makar, Tania Martinez Navedo, Matthew Mitchell, John Monninger, Bruce Musico, Ryan Nolan, Vonna Ordaz, Donald Palmrose, Pravin Patel, Malcolm Patterson, Tom Pham, Kevin Quinlan, Sheila Ray, Sujit Samaddar, Ellen Smith, Angelo Stubbs, Edward Stutzcage, Emil Tabakov, Seshagiri Tammara, Robert Taylor, Theodore Tjader, Richard Turtil, Yuken Wong, Zuhan Xi, Jack Zhao,

Daniel Barnhurst, Jack Cushing, Jennifer Davis, J. Peyton Doub, Kenneth Erwin, Mohammad Haque, Stacey Imboden, Andrew Kugler, Ann Miracle, Daniel Mussatti, Kevin Quinlan, Lance Vail and Alicia Williamson.

CHAIRMAN SVINICKI: Thank you.

And, I can generally see most of you. There may be a couple of witnesses that are blocked a little bit by the pillars. Maybe if you would move off to one side or the other so I can cast my gaze on you while I read the oath.

So, please, for all the NRC staff witnesses, would you raise your right hand while I read the oath?

Do you swear or affirm that the testimony you will give -- provide in this proceeding is the truth, the whole truth and nothing but the truth?

(CHORUS OF I DO)

CHAIRMAN SVINICKI: Are there any witnesses who did not take the oath?

(NO RESPONSE)

CHAIRMAN SVINICKI: Okay, hearing none. Are there any objections to including the witness as part of the record?

MS. LEIDICH: No, there are not.

CHAIRMAN SVINICKI: In the absence of

objections, the witness list is admitted to the record.

The witnesses may please take their seats again.

Thank you very much.

We will now turn to the NRC staff's exhibits. Counsel, are there any changes to your exhibit list?

MS. WRIGHT: No, there are not.

CHAIRMAN SVINICKI: Please read the range of numbers of the exhibits to be admitted.

MS. WRIGHT: NRC-001 to NRC-011.

CHAIRMAN SVINICKI: Is there a motion to admit the exhibits into the record?

MS. WRIGHT: Yes, there is.

CHAIRMAN SVINICKI: Are there any objections to the admission of the exhibits and the exhibit list into the record?

MS. LEIDICH: No, there are not.

CHAIRMAN SVINICKI: In the absence of objections, the exhibits and exhibit list are admitted into the record.

Okay, thank you, counsel.

That is -- we've disposed of those important matters very capably, so I ask now that

we're going to turn to the first of the witness panels and the counsel may be excused at this point. Thank you.

MS. LEIDICH: Thank you.

MS. WRIGHT: Thank you.

CHAIRMAN SVINICKI: So, as I noted earlier in the order of the day, we will now begin with two separate overview panels.

The first of those will be provided by the FPL witness and they will provide an overview of FPL's application.

After each overview panel, we will have a round of questions from the Commissioners.

For the two subsequent presentations, the safety panel and the environmental panel, first, FPL and then the staff will testify followed by an opportunity for the Commission to pose questions to both parties.

The Commissioners will have an opportunity to bank their time as they see fit to focus on particular questions over the course of the day. And, as is our practice, we will rotate the order of questioning throughout the day.

I remind all witnesses of this panel and other panels who will appear before us throughout the

day that they remain under oath and that the Commission is also familiar with your prehearing filings.

And, I will note, I don't think it will happen for this overview FPL panel, but if a witness or individual should need to come to the podium to respond to a question or otherwise speak, please approach the podium and wait to be addressed and to be sworn in if you have not previously been sworn in.

So, with that opening, I would ask the FPL panelists for the overview panel to please introduce themselves and then proceed with the presentations.

Thank you.

MR. NAZAR: Good morning, Commissioners. My name is Mano Nazar. I'm the president of the -- and Chief Nuclear Officer of the Florida Power and Light and its parent company, NextEra Energy.

I'm very pleased to appear before you today on the issuance of the Combined Construction Permit and Operating License for Turkey Point 6 and 7.

Before I start, I would like to recognize the significant work put forth by the NRC staff in reviewing our application and the diligent work of all employees at the FPL supporting that review.

I know that the NRC staff has totally

analyzed our application, demonstrating that the construction and operation of the Turkey Point 6 and 7 would be consistent with the NRC mandate to protect the public safety and health.

Staff also has performed a detailed review of the environmental impacts associated with the project.

Now, let me talk a little bit about the FPL, if we could change to slide number two.

FPL is one of the largest rated regulated electric company, electric utility in the United States. It serves approximately about 10 million people, to 4.9 million customer accounts in Florida.

Florida Power and Light service reliabilities is better than 99.98 percent which ranks among the best nationwide.

FPL also high fuel efficient power plant fleet is one of the cleanest among the utility nationwide.

The typical customer bill is 30 percent lower than national average and the lowest residential bill in Florida.

As I mentioned, FPL is wholly owned subsidiary of the NextEra Energy. NextEra Energy, a little about the company as a whole, the parent

company of the FPL, Florida Power and Light and also NextEra Energy resources, is based on the market cap, the largest electric company in the world.

NextEra Energy is the leading clean energy company with consolidated revenues of approximately $16.2 billion.

Over 45,000 megawatt generation capacity and approximately 14,270 employees in 30 states and Canada as of end of the 2016.

In addition to FPL, NextEra Energy and other principle subsidiaries, NextEra Energy resources, as I mentioned earlier, which is the world's largest generator of the energy from the wind and the sun.

Two, it's a fairly adept entity is NextEra Energy resources owns and operates three nuclear power plants, four units, Seabrook Nuclear Power Plant, Point Beach Nuclear Power Plant and Duane Arnold.

Let's go to slide three.

I want to talk a little bit about the nuclear fleet within the NextEra Energy.

NextEra Energy nuclear fleet has extensive experience with nuclear power plants. And, FPL is well-qualified to construct and operate Turkey Point 6 and 7.

NextEra Energy nuclear fleet is one of the largest in the country with 8 units at five different sites representing approximately about 6 percent of the U.S. nuclear power electric generation capacity.

And, it accounts for about a quarter -- 25 percent of the NextEra Energy total generation.

FPL, on the FPL side, we operate 4 units, two units at St. Lucie Nuclear sites and 2 units at Turkey Point with a total net generation of about approximately about 3,500 megawatts.

The investment to build these units in 60s, 70s and 80s resulted in significant value to the FPL customers in terms of safe, reliable, clean, cost-effective, base load energy and is one of the reasons why FPL is leading in the low-cost reliable and clean electricity today.

Turkey Point and St. Lucie accounted for nearly about 25 percent of the FPL generation in 2016.

As I mentioned previously, FPL affiliated NextEra Energy resources also owns and operates at Seabrook, Point Beach and Duane Arnold plants. Together, that NextEra nuclear fleet the capacity to generate more than 6,500 megawatts of the emission-free electricity, enough to supply the needs of nearly about 5 million households.

NextEra takes its commitment to protect the health and safety of the public very seriously. The operational performance of the NextEra Energy nuclear fleet reflects strong nuclear safety and reliability record.

NextEra's top priority remains to provide safe and reliable generation and has maintained the safety and reliability of its nuclear fleet by following our core principle which is defined in our nuclear excellence model.

Over the past decade, the FPL successfully completed extended power operating projects at both St. Lucie, two units at St. Lucie and two units at Turkey Point, four units.

In addition, at NextEra Energy resources also the power operate was implemented at two units of Point Beach, I mentioned earlier.

At FPL, those operates provided approximately about 530 megawatts of the additional nuclear capacity. All together approximately about 750 megawatts within the NextEra Energy at six units, two Point Beach units, two St. Lucie and two Turkey Point.

Today, FPL's customers are benefitting from lower fuel costs and reduced system emissions

provided by this additional nuclear capacity.

Similarly, a Combined License for Turkey Point 6 and 7 would be particularly valuable to FPL. It would provide an option for new carbon-free power to Florida clean energy portfolio that would help to maintain system reliability.

And, also provides fuel diversity and protect against price volatility.

At this time, the best path forward for FPL is to preserve all of its options to meet future demand, including Units 6 and 7.

I will now turn the presentation over to Bill Maher to my left who is the Senior Licensing Director, New Nuclear Projects and to Steve Franzone, New Nuclear Projects Licensing Manager who will provide an overview of the proposed units and their licensing.

MR. MAHER: Good morning, Commissioners. I'm Bill Maher, Senior Director of Licensing and New Nuclear for Florida Power and Light.

I want to begin by echoing the sentiments you just heard and thank the NRC, especially the NRC staff for its diligence in conducting a through review of our application.

Likewise, I want to recognize the current

and former members of our FPL team who have worked tirelessly over the past several years to reach this point.

As you are well aware, the work required to get to this hearing is very challenging and we are very pleased to have the opportunity to discuss our Turkey Point COL application with you.

The development of the Turkey Point COLA has presented some unique challenges and learning experiences for us in applying the Part 52 licensing process.

Our presentations today will focus on the safety and environmental aspects that are unique to Turkey Point.

We selected the AP1000 as our design for a variety of reasons, chief among them being the passive safety features and our familiarity with PWR technology.

The opportunity to collaborate with other utilities in the southeast who also chose and are constructing the AP1000 design offers significant advantages and we have benefitted from this collaboration.

We have been following the experiences at Vogtle and Summer over the past year with great

interest and will continue to monitor the ongoing progress at Vogtle to ensure we can leverage their experience.

Issuance of the COL would provide FPL with a valuable option to meet future generation needs. Although we have not made a final decision to build, the ability to add emission-free nuclear generation in Florida is an important element in our integrated resource planning.

Our integrated resource plan which is annually updated and filed with the Florida Public Service Commission projects significant growth in electric demand over the next ten years.

Slide number four, please?

Once FPL began its consideration of new nuclear, we engaged in a robust and comprehensive site selection process, evaluating alternative sites and completing extensive site characterization at Turkey Point.

As part of Florida's site certification process, numerous public outreach sessions were held to solicit public input into options for transmission line routing.

The plant site has excellent placement within our transmission system and has been approved

by the State of Florida.

Florida's unique geography with its largest metropolitan area near the southern end of a peninsula present challenges for transmission planning and large generating facilities that must be located with adequate foresight.

FPL's site selection study looked at its entire service territory with a special focus on areas that would serve the Miami Load Center.

FPL did not identify any alternative site that was obviously superior.

Our COL application, the NRC staff's final safety evaluation report and the NRC's final environmental impact statement fully support each of the Commission's findings required for issuance of the COL.

In summary, FPL believes it is well positioned to construct, own and operate an additional nuclear facility.

We have the operational experience to make Turkey Point project a success. Our staff of proven nuclear professionals will ensure safe, reliable, economic and environmentally sound operation at the Turkey Point facility.

At this point, I would like to introduce

the rest of our presenters for today's hearing.

Steve Franzone to my left has over 38 years of industry and Navy nuclear experience in plant operations, licensing, engineering and major projects. He is responsible for the licensing at Turkey Point.

Paul Jacobs, Paul has worked in the nuclear industry for over 40 years with experience in design and plant engineering. He is responsible for engineering support of the Turkey Point project.

Rick Orthen, Rick has worked in the nuclear industry for over 38 years with experience in radiation protection and environmental support of plant operations. He is responsible for environmental support and required for Turkey Point licensing and permitting.

Thank you for your time and attention. And, I'll turn it over to Steve Franzone to provide overview of site and licensing activities.

MR. FRANZONE: Slide five, please?

Thank you, Bill, and good morning, Commissioners.

This is Steve Franzone. I would like to give the Commission a brief overview of the Turkey Point 6 and 7 site.

This is a map of south Florida area and it

shows the Turkey Point location relative to Miami. The site is located in southeastern Miami-Dade County and is approximately 25 miles south of Miami.

On the east side of the site are Biscayne Bay and Biscayne National Park. To the west of the site are the two closest cities, Homestead and Florida City. And, further west, you'll find Everglades National Park.

The site is eight miles east of Florida City and nine miles south-southeast of Homestead.

The closest primary public roads are US Highway 1 and the Homestead Extension of the Florida Turnpike.

The site is typically accessed from Palm Drive which is also known as Southwest 344th Street which runs directly east/west from the site to Florida City.

Slide six, please?

FPL proposes to locate its two 1,100 megawatt electric AP1000 units on an approximately 218 acre island area located within the existing industrial waste water facility.

This industrial waste water facility contains the cooling panels that are associated with the existing units.

The site is permanent on limestone site with alternating layers of silty sand. For associated facilities such as the reclaim water treatment facility and the radial collector wells, where possible, wetland impacts were avoided and minimized by selecting previously impacted areas and environmentally sensitive engineering. I will talk about those plant features shortly.

As you can see in the picture, the current grade at the nuclear island is near sea level. During construction, it will be raised to an elevation of 26 feet to accommodate storm surge and wave run up heights.

The major site preparations include removal of the top layer of the island which ranges from 3 to 11 feet and building a mechanically stabilized earth wall.

One of our goals while performing this work will be eroding interactions with existing units in the operation at the site.

Next slide, please?

Planning 6 and 7, FPL was able to take advantage of existing well-established technologies in order to not only minimize our impact to the surrounding environment, but also to help governments

with environmental compliance.

As you are aware, we are proud to have been able to work out an agreement with Miami-Dade County for the use of reclaimed water as a primary source of cooling water for Unit 6 and 7. This will help the county meet mandated water use requirements.

Many examples of the beneficial use of reclaimed water exist in various industries including power generation. This resource has been used successfully at Palo Verde.

In the event this reclaimed water is not available in the quantity or the quality that we need, radial collector wells will serve as a back up source of cooling water.

Again, this is a well-established technology used for many different purposes including power generation.

Extensive ground water modeling has been performed to demonstrate that all these wells will have minimal impacts to the surface water.

If you look at the photo on the right hand side of this, you'll see -- on the right hand side of the slide, you'll see the actual Turkey Point from which the site took its name.

The radial collector wells will be

installed here on the point and extend laterally underneath Biscayne Bay. Paul Jacobs will go into further detail about the construction and operation of both the reclaimed water and the radial collector wells during the safety and environmental panels.

Slide eight, please?

I will now point out a few of the features to assist in the construction and operation of the facility.

Construction laid out is within the industrial waste water facility. We will construct an onsite facility to treat the reclaimed water to meet the requirements for use in a nuclear plant and cooling towers.

Location of the reclaimed water treatment facility was selected to optimize the routing of the reclaimed water pipelines and minimize associated wetland impacts.

Working with Miami-Dade County, FPL moved the proposed facility to this location in an effort to reduce wetland impacts.

As to the radials, the existing road to the radial collector well will be used. No widening of the existing access road to the Turkey Point peninsula is proposed.

Other features include separate construction access roads, barge slip improvements as well as the installation of a heavy haul path using existing roadways.

Slide nine, please?

Okay, so, for this figure, the south is on the bottom on the figure.

So, we'll start -- and then if you wanted to know where 3 and 4 was, above and slightly to the right outside the figure would be the Units 3 and 4, just to kind of give you a feel for where we're at.

So, we'll start from the south and work our way up. And, just above the bottom of the photograph, you'll see the light blue area which is actually the make up water reservoir and that has about a three day supply or reclaimed water for cooling water for the units.

Within the makeup cooling water reservoir, you'll find the mechanical draft cooling towers, three per unit. Okay? And then, right above that, you'll see these little orange boxes with the dot in the middle, okay, those are our underground injection wells. And, those are for effluent and blow down disposals. And, Paul will be talking about those, too, later on.

Next, you'll find Unit 6 and 7, it's a standard layout. Unit 6 is on the right hand side, Unit 7 is on the left hand side. And then, right above that, you'll see the Clear Sky Substation on the left and then parking and other facilities on the right.

Okay, slide ten, please?

Okay, so, as a point of reference, this view would be looking north from Unit 6 and 7. Let's talk about the history of the site.

Construction on the site started in 1965 with the two original fossil units. Construction on the first nuclear unit started in 1967 when the AEC granted the construction permit for Units 3 and 4.

Units 3 and 4 commenced commercial operation in 1972 and 1973 respectively.

The first American crocodile was found in the cooling canals in 1976.

One of the milestone events which impacted not only the site but the entirety of south Florida was when the eye of Hurricane Andrew made landfall in 1992 over the plant.

Compared to Homestead and other surrounding areas, the site was relatively undamaged and its robust design really enabled the existing

nuclear units to be available early in the recovery process.

I was working at the maintenance department at Turkey Point during this time period. We had a mandatory evacuation for my neighborhood, however, I was to make -- I was able to make it back home the day after Andrew hit.

My home at the time was located just a little south of the maximum surge, and being within one to two miles of Biscayne Bay, we had shrimp and puddles outside my front door and we had lots of fish swimming around in our pool.

After driving through the devastated area on the way to the plant, I was both relieved and pleased to see how little damage the plant had sustained compared to the surrounding area.

Now, we'll jump ahead to 2007 when a combined cycle natural gas unit began commercial operation at the fifth power generating facility at the site.

As a result, these AP1000 units would be Units 6 and 7 at Turkey Point. Since we submitted the application, the two existing nuclear units completed power up rates of approximately 100 megawatts electric each and are now approximately 800 megawatts net.

Turkey Point's Units 1 and 2 are no longer operating and have been converted to synchronous condenser mode which either generates or absorbs reactor power as needed to adjust the grid to voltage or to improve the system power factor.

The smoke stack which you can see in this picture had been a landmark for Boda and Biscayne Bay many, many years and have now been removed.

Okay, slide 11, please?

Okay, this slide shows a rendering of the proposed units. Of course, it's a little dated as it includes the stacks from Units 1 and 2. But, this gives us a sense of the overall project as it would be built.

Realizing that the site has a unique location and potential impact environmental resources, FPL has endeavored to take this into account in the planning for the new units.

For instance, FPL will use an existing barge slip for receiving and unloading heavy equipment. We relocated the reclaimed water treatment facility to reduce wetland impacts and, foremost, we are using land for the site which is in the already impacted industrial waste water facility.

Slide 12, please?

During our Combined License review, we were able to take advantage of the design center working group process and gain efficiencies from other AP1000 applicants.

Several generic design issues were identified during the application process and were efficiently resolved for Turkey Point once those issues were resolved for the Levy Plant.

In addition, FPL addressed such issues as the Fukushima event, Central Eastern United States seismic source characterization and the NRC electrical bulletin 2012-01 related to an off site power loss of phase event as part of the design center working group process.

We have continued to interface with the licensees as these same benefits of the DCWG process apply after an applicant receives its license.

It was very helpful resolving issues one time and we're able to take full advantage of the process.

Slide 13, please?

Slide 13 shows a total list of exemptions for our application. In fact, all of these same exemptions have been approved by the NRC for other AP1000 applicants.

The five previous generic issues exemptions were issued -- were taken by Levy and WS Lee.

The maximum wet -- safety wet bulb non-coincident air temperature exemption was necessary because the Turkey Point value exceeded the DCD value by 1.3 degrees Fahrenheit.

This is the same exemption granted to VC Summer, although their value was one-tenth of a degree less than the Turkey Point value.

A sensitivity analysis was performed and there was no increase in containment peak pressure for Turkey Point when using the higher Turkey Point value.

VC Summer was able to use our analysis for their exemption since our value was bounding.

Next slide, please?

FPL has a 50-year history of environmentally responsible power generation at the Turkey Point site which includes part of the critical habitat for our population of American crocodiles.

This photo on the bottom right side is our crocodile nursery which had its first customer before we even finished our nursery.

Our proposed units carry on this history in environmental protection philosophy. We are proud

of our use of reclaimed water to help turn a waste stream into a benefit for Miami-Dade County and the environment.

Our back up cooling water system, largely unseen from land, will operate with no discernable impacts to aquatic communities it shares.

FPL's philosophy is to avoid environmental impacts first, if they can't be eliminated, we will then minimize impacts and finally mitigate the remaining impacts an acceptable level using approaches such as wetland restoration, enhancement projects and mitigation bank credits.

Our project location allows for the avoidance of a significant wetland impact, the biggest one are here is our site lies within the existing industrial waste water facility.

Practically 80 percent of our transmission lines will be in existing corridors. I should note that our assessments of project impacts used bounding assumptions and we fully expect that the realized impacts will be much smaller than what we predicted.

Slide 15, please?

The NRC began its independent environmental review of the project, including FPL's environmental report in 2009. The environmental

scoping was completed in 2010 and the staff issued the draft environmental impact statement in 2015.

There is a large amount of interest in the project from stakeholders at every stage of its review who comment extensively on the impacts process and conclusions.

FPL met with several stakeholders in order to help them better understand the issues the NRC were tasked to examine.

The stakeholder input was an important aspect of bringing the NEPA review process to closure in 2016 when the final EPIS was made available.

For me, personally, having never been through the environmental review process before, I was impressed with the breadth and depth of the environmental review associated with licensing a nuclear plant.

I was pleased to see the interest from the public during the many meetings for the project.

During this time period as well, the NRC licensing board reviewed a challenge to the environmental review of certain nonradiological aspects of disposing of waste water using injection wells.

Ultimately, the board concluded that the

NRC staff's EIS adequately evaluated these potential impacts with no changes necessary to the staff's review in the EIS.

Last slide, please?

Thank you very much for this opportunity. This completes FPL's overview presentation.

CHAIRMAN SVINICKI: Thank you very much for that overview presentation.

We will begin on this question and answer period. I will be recognized first, so let me begin.

Again, that was a very informative overview. Also, I appreciate that you have given some context to the specific and novel issues that were posed in the staff's review of this particular application.

So, I think that will be helpful, some of that we'll be exploring, I know, in more depth when we get to the safety and environmental panels later this morning and this afternoon.

I -- my questions are fairly general. Again, this is an overview discussion.

I know that there may be some duration of time between if the Commission authorizes the issuance of the licenses. Between that action and a decision on whether or not to construct these units, there has

been mention made of your integrated resource planning and the annual update that is done to that.

Could you discuss or describe, though, at a very high level as that integrated resource plan is looked at on an annual basis, how would these licenses come into play in the potential construction of these units?

What are some of the triggers or high level factors, obvious need for power, but you don't need to choose these units to be the new units to provide that power.

Can you give a kind of at a strategic or very high level how that will be approached in the years between granting of the licenses, should the Commission vote to do that, and initiation of construction, what would that period look like in terms of weighing strategic options for FPL?

MR. NAZAR: Madam Chairman, the additional nuclear capacity remains an important consideration at FPL resource planning.

With respect to obtaining the COL for Turkey Point 6 and 7, we're going to pause, as you know, that the first wave of construction that is ongoing, there are significant opportunities for learning from those constructions.

So, at this point, we plan to pause and continue monitoring the construction of the Vogtle projects and lessons learned from that.

As I mentioned during my remarks, that when we implemented the operate at six of our units that we gained significant experience of the construction. And, actually, dealt with some of the construction companies that they are building actually new nuclear power plants.

That mega project was more than $4 billion project. So, we had a great deal of learning from that particular project.

In addition to that, as we continue learning from the first wave of construction, then, at that point, that we're going to decide as far as the timing. It's very important for us to make sure that the lessons learned are going to be incorporated into our decision making.

And, that would serve not only our company but our customers a great deal to make sure that we -- once we decide to start with the pre-construction, that we are going to be very efficient, cost-effective and providing the benefit that our customers expect from us.

CHAIRMAN SVINICKI: Thank you.

From that, is it accurate to characterize that FPL will have an active knowledge management program over this, again, option of building these units at some point in the future?

You indicated that you would be monitoring ongoing activities with AP1000. Will you have kind of a center of expertise within FPL that will be the institutional knowledge in case there is, again, this duration of time between the hearing and the Commission subsequent authorization of issuance of the license, should we authorize that and the decision that you would have to construct?

MR. NAZAR: Madam Chairman, at this point, that we plan to maintain the COL. And, in order to maintain that, we're going to continue keeping up with the lessons learned from the first wave of construction.

We plan to keep some Duke Power employees that they've involved with the application for the COL -- on Turkey Point 6 and 7, that they're going to continue those learning opportunities and then we're going to incorporate in real time as we're learning those opportunities.

CHAIRMAN SVINICKI: Thank you.

My second question is a little more narrow

in scope. There was a description of the departures and exemptions that were taken in the application. And, I would characterize those as being a very judicious pursuit of exemptions and departures.

Because I think, essentially, there was only one Turkey Point specific exemption and it's only the value for wet bulb that varied with another applicant. So, that wasn't truly unique in the sense that only Turkey Point pursued that exemption.

What was the overall strategic approach to deciding to limit yourselves in that way? Obviously, there could have been other matters that you might have taken some site specific approach to.

So, was it to have strong coherence with the referenced COLA? Could you just describe again how you approached taking such a, again, such a narrow pursuit of exemptions and departures?

MR. MAHER: Yes, Madam Chairman.

The reason for the narrow pursuit, if you will, is really to benefit from the design center working group and be able to coordinate with the other AP1000 applicants in a combine way to be able to share costs associated with those and share the lessons learned and calculations associated being able to apply those.

So, like Mr. Franzone had told you with respect to the non-coincident air temperature, Summer units had the exact same issue and we were able to coordinate with Westinghouse and the associated calculations and requests to the Nuclear Regulatory Commission to be able to provide that appropriate level of calculations and exemptions.

CHAIRMAN SVINICKI: Okay, thank you for that.

Next, I will recognize Commissioner Baran for any questions he may have.

COMMISSIONER BARAN: Thanks.

Well, welcome, thank you for your presentations.

Mr. Franzone mentioned Hurricane Andrew. Given the location of Turkey Point, hurricanes are obviously a natural hazard that the proposed units would need to be able to handle.

Hurricane Irma made landfall in Florida a couple months ago well to the southwest of this site. At its peak, Irma had sustained winds of 185 miles per hour and estimated gust wind speed of 225 miles per hour.

Would the proposed units be able to safely handle a direct hit from a hurricane like Irma?

MR. FRANZONE: Well, the short answer is yes. Right? Because we -- and, you'll see in the safety panel, we discuss some wind events.

But the -- for the AP1000, the controlling event was the tornado missiles. And, we actually went a step further and looked at hurricane generated missiles because the straight line winds of the hurricane.

And, when we evaluated that, Westinghouse evaluated for that, there was no issues.

So, even a hurricane like Irma was easily -- could have been handled by the -- because the actual wind that we used was 260 miles per hour, we got that from the Reg Guide 1.221. So --

COMMISSIONER BARAN: You have substantial margin over a hurricane like Irma?

MR. FRANZONE: Correct.

COMMISSIONER BARAN: Okay, thank you.

That's all I have for this panel.

CHAIRMAN SVINICKI: Thank you.

Commissioner Burns?

COMMISSIONER BURNS: Yes, thank you.

And, I appreciate the presentations and the testimony of the -- on this opening panel on behalf of the Applicant.

Mr. Maher, you made a reference to unique experiences. I think I've got the sentence right. In terms of Part 52 and the implementation of the Part 52 process, and, if you don't mind, I'd appreciate if you would elaborate what your experiences were with Part 52.

If you want to put it in the context, what may have surprised you or what were bigger hurdles? Because, I think, and part of it is, you know, from my own interest in terms of having been involved with this process almost since the beginning, well, yes, since the beginning.

And, knowing that, in some respects, it's only, even though this is a rule that dates back to 1989, this is really a rule that has only been exercised since the turn of the century.

So, I'd appreciate the insights you were alluding to from your experience with it.

MR. MAHER: Yes, sir.

Part of my unique experiences with Part 52 is being able to utilize the design certification process as part of the application.

I think that it was a very unique feature associated with the licensing process. And, understanding the previous licensing process was a

very big benefit associated with applicants and I believe with NRC staff and being able to go through and approve those licenses.

With respect to the unique features of it, I would say having a standardized design and being able to coordinate with other applicants, both on the -- on engineering features and engineering issues that came up as a result of that particular standardized design in a coordinated fashion was very beneficial to both us as an applicant and, hopefully, to NRC and the other utilities.

COMMISSIONER BURNS: Okay.

And, some of -- what would you say were some of the challenges with it? Because, as you say, one of the -- and you've actually spoken to what I would call some of the intention behind Part 52, which is to enhance standardization of units.

And, thus, and also in terms of making the licensing process more effective as a result of that standardization.

But, I think there have been some unintended consequences, too. So, what I'd appreciate, you know, sort of your perspective on that.

MR. MAHER: Thank you.

And, there were some challenges associated with that. And, Steve alluded to that as part of his overview presentation dealing with the design issues, if you were, that came about as a result of the ongoing construction aspects and design finalization on the Summer and Vogtle units.

Those particular design issues came up as a -- at a time when they were constructing their units. But, when there were three other applicants that needed to go through and complete their COL process.

And, as a result of that process, that challenged both us and Duke in being able to finalize those particular issues as COL applicants to the NRC staff's satisfaction even though they were actually identified as part of the design finalization efforts at Vogtle and Summer.

COMMISSIONER BURNS: Okay, thank you.

Just out of curiosity, I saw some of the maps, although a little strained to be able to see them on those screens.

Have you undertaken any what we'll call pre-construction activities or site preparation activities for the area that would be used for 6 and 7?

MR. MAHER: No, sir, we have not taken any pre-construction activities associated with the site. Under Florida law, we are precluded from actually doing --

COMMISSIONER BURNS: Okay.

MR. MAHER: -- those activities until we get public service commission approval.

COMMISSIONER BURNS: Okay, all right, thank you.

And, my final question for this panel, you spoke about sort of cooperation among other applicants and following the activities, for example, the construction activities that have been undertaken at both Vogtle and Summer.

Mr. Nazar may have mentioned this, but, are you also trying to get any insights from the experience with the construction in China?

MR. NAZAR: Yes, Commissioner.

Actually, we have visited both of the sites, AP1000 sites in China. And, during the construction. And, there we keep all the exactly as you mentioned, they have been learning opportunities from China also.

Myself in addition to some of the staff, we visited both sites when they were at 60 percent

completion and at 80 percent completion. And, we had significant learning opportunities, especially some of the design changes that Mr. Maher referred to and also making sure that our COL was going to take those into consideration for our applications.

COMMISSIONER BURNS: Okay, thank you.

Thank you, thank you, Chairman.

CHAIRMAN SVINICKI: Again, I thank the panel.

I will now ask the NRC staff overview witness panel to please take the seats at the table.

In this panel, the staff will provide an overview of its review of the application and a summary of their regulatory findings.

As the panelists are preparing to take their seats here, before they begin presenting, I would ask that they introduce themselves.

And, I believe that we will begin with the Deputy Director of the Office of New Reactors, Vonna Ordaz. Vonna, when you are ready, please proceed.

MS. ORDAZ: Good morning.

CHAIRMAN SVINICKI: Good morning.

MS. ORDAZ: I'm Vonna Ordaz. I'm the Deputy Director for the Office of New Reactors.

MR. AKSTULEWICZ: Good morning,

Commissioners. I'm Frank Akstulewicz, I'm the Division Director in the Division of New Reactor Licensing.

MS. DIXON-HERRITY: And, I'm Jennifer Dixon-Herrity, I'm Chief of Licensing Branch IV, the branch that manages the AP1000 design center reviews.

CHAIRMAN SVINICKI: Great, Vonna, please lead off.

MS. ORDAZ: Thank you, Chairman, good morning.

On behalf of the NRC staff, that reviewed the Turkey Point Units 6 and 7 Combined License Application, or COLA, we are pleased to address the Commission at this mandatory hearing.

The team here today will present the results of the staff's review of the Turkey Point Units 6 and 7 COLA.

The Applicant, Florida Power and Light, or FP&L, proposed to locate the new units in Miami-Dade County, Florida at the Turkey Point site where it has five existing power generating units.

Unit 1 and 2 operate as synchronized condensers to stabilize the grid but do not generate power. Units 3 and 4 are two pressurized water reactor nuclear units. And Unit 5 is a natural gas

combined cycle steam electric generating unit.

The staff's final safety evaluation report, or FSER, was made publically available on November 14, 2016. And, the staff's final environmental impact statement, or FEIS, was published on October 28, 2016.

These documents are a combination of a seven year review by the staff and represent the results of the coordinated effort of scientists, engineers, attorneys and administrative professionals from multiple offices within the Agency as well as other agencies and our consultants.

Slide 2, please?

With me on this panel, Mr. Frank Akstulewicz, the Director of the Division of New Reactor Licensing and Ms. Jennifer Dixon-Herrity, as she mentioned, Chief of the Licensing Branch IV who has responsibility for all of the AP1000 reviews.

Jennifer kindly is replacing Anna Bradford today at this hearing. Anna had an unexpected emergency.

Slide three, please?

Today, I will give you an overview of the COLA and the staff's review.

Mr. Akstulewicz will summarize the staff's

findings in the safety review.

And, Ms. Dixon-Herrity will give an overview of the environmental review and findings.

The staff docketed the initial version of the COLA in September 2009 and completed its review in December 2016.

During that period of time, the staff expended approximately 89,000 hours on the safety and environmental reviews.

This effort involved well over 100 engineers, scientists and technical specialists.

During this time, the staff conducted approximately 80 public meetings and conference calls in support of the Turkey Point COLA review.

The Applicant responded to approximately 516 staff questions, of which 340 were associated with the safety review and 176 with the environmental review.

In addition, the staff considered over 11,000 public comments on the draft environmental impact statement.

Contractors working in collaboration with the staff devoted over 16,000 hours to support the environmental and safety reviews.

The review of this application was a very

thorough effort and focused on safety and protecting the environment.

Within the NRC, the offices that contributed to the review include the Office of Nuclear Security and Incident Response which reviewed the emergency preparedness and security areas, the Office of Nuclear Reactor Regulation which evaluated financial qualification aspects of the application and the Office of the Nuclear Material Safety and Safeguards which support the reviews for the licenses under Part 30 for byproduct material, Part 40 for source material and Part 70 for special nuclear material.

The Office of the General Counsel reviewed the FSER and the FEIS.

And, finally, the Advisory Committee on Reactor Safeguards, or ACRS, reviewed and reported on the safety aspects of the Turkey Point application in accordance with the requirements of 10 CFR 52.87.

In addition, NRC Region II supported environmental meetings in the community near the Turkey Point site.

The U.S. Army Corps of Engineers, National Park Service and the Department of Homeland Security also contributed to the NRC review.

Specifically, the U.S. Army Corps of Engineers provided input on the various sections of the FEIS including, but not limited to, wetlands, ecology and cultural and historic resources.

I would like to note that Ms. Meghan Clauser from the Corps, the Corps is Jacksonville District is with us today, welcome Meghan. And, we thank her for assistance throughout this process.

The National Park Services provided special expertise for the areas in and around the adjacent Biscayne and Everglades National Parks.

And, the Department of Homeland Security reviewed the offsite emergency plans.

Slide four, please?

On June 30, 2009, FP&L submitted the COLA to construct and operate two AP1000 units in Miami-Dade County, Florida.

The Turkey Point Units 6 and 7 COLA incorporates by reference the AP1000 design certification document revision 19 and Appendix D to 10 CFR Part 52, the AP1000 design certification rule.

The AP1000 design was certified by rule in 2011 and documented in NUREG-1793 and its supplements.

Based on the finality that NRC regulations afford to a certified design, the scope of the staff's

COL technical review did not include items that were resolved within the scope of this certified design.

Additionally, the staff's review applied the design center review approach, the Commission's policy intended to promote standardization of COLAs.

This policy directs the staff to perform one technical review for information, comments and multiple applications that is outside the scope of the design certification and used the decision resulting from the single review to support decisions on multiple COLAs or subsequent COLAs.

The review for the Turkey Point Units 6 and 7 primarily focused on plant specific aspects of the application that are the responsibility of the Applicant such as operational programs, site specific design, COL information items and departures from the certified design.

The Turkey Point COLA is the only remaining application referencing the AP1000 design currently before the Commission.

The Commission has previously issued eight Combined Licenses for units referencing the AP1000 design.

Slide five, please?

In accordance with 10 CFR 52.87, the ACRS

examined the staff's safety review of the Turkey Point Units 6 and 7 COLA.

The Applicant and staff support one AP1000 ACRS Subcommittee meeting, specifically related to Turkey Point COLA and safety evaluation.

The staff presented the results of its review of the Turkey Point COLA to the full ACRS in September 2016.

Following the 2016 September full Committee meeting, the ACRS issued a report on September 16, 2016 concluding that there is reasonable assurance that Turkey Point Units 6 and 7 can be built and operated without undue risk to public health and safety.

This ACRS report recommended approval of the Turkey Point COLA.

The staff issued the Turkey Point Units 6 and 7 FSER on November 14, 2016. This FSER and FEIS and our statement in support of the hearing provide what the staff considers an adequate basis for the Commission to make the necessary regulatory findings under 10 CFR Part 52.97.

We look forward to responding to your questions at this hearing. I will now turn the presentation over to Mr. Frank Akstulewicz.

MR. AKSTULEWICZ: Thank you, Vonna.

Good morning. I'm Frank Akstulewicz, the Director in the Division of New Reactor Licensing in the Office of New Reactors.

Slide six, please?

The staff prepared SECY-16-0136 dated December 2, 2016 to support this mandatory hearing. In that paper, the staff summarized the bases that would support the Commission's determination that the staff's review is adequate to support the findings set forth in both 10 CFR 52.97 and 10 CFR 51.107.

The SECY paper provided an overview of the findings that support the issuance of COLs for Turkey Point Units 6 and 7.

The Commission must make each of the following findings in 10 CFR 52.97 in order to issue a COL. I will summarize the staff's bases supporting each finding.

First, the applicable standards and requirements of the Atomic Energy Act and the Commission's regulations have been met.

The staff reviewed and evaluated the application against the applicable criteria in the Commission's regulations. Based on the staff's review as documented in its final safety evaluation report

and then the final environmental impact statement, the staff concludes that the applicable standards and requirements of the Atomic Energy Act of 1954 as amended and the Commission's regulations have been met.

Second, any required notifications to other agencies or bodies have been duly made.

As documented in SECY-16-0136, all required notifications such as to the Public Service Commission of Florida as well as the required Federal Register Notifications have been made.

Slide seven, please?

Third, there is reasonable assurance that the facility will be constructed and will operate in conformity with the license, the provisions of the Atomic Energy Act and the Commission's regulations.

As the SECY paper states, the staff believes that its review as documented in the safety evaluation and impact statement, the inspections, tests, analyses and acceptance criteria, or ITAAC, and the license conditions provide the necessary assurance that the units will be constructed and operated as required.

Fourth, the Applicant is technically and financially qualified to engage in the activities

authorized.

The technical and financial qualifications of the Applicant are summarized in the SECY paper and documented in more detail in Chapters 1, 13 and 17 of the final safety evaluation report.

Slide eight, please?

Fifth, the issuance of the COLs will not be inimical to the common defense and security or public health and safety.

The specific bases for inimicality finding have been provided in the staff's SECY paper.

And, sixth, the findings required by Subpart A of 10 CFR Part 51 have been duly made.

The staff's conclusion supporting the environmental findings required by Subpart A will be presented by Jennifer Dixon-Herrity who will now provide an overview of the staff's environmental review.

MR. DIXON-HERRITY: Thank you, Frank.

Good morning, I'm Jennifer Dixon-Herrity. As we said before, I'm Chief of Licensing Branch IV in the Office of New Reactors.

I'll be discussing the environmental review and will provide an overview of the process we used in conducting the review, the draft summary of

record of decision and the staff's recommendation as a result of that review.

I will also discuss the regulatory findings that need to be made under 10 CFR 51.107 before the licenses can be granted.

Slide nine, please?

The staff prepared the EIS for the Turkey Point Units 6 and 7 COLA in accordance with the National Environmental Policy Act of 1969 and the requirements of 10 CFR Part 51.

The staff prepared the EIS based on independent assessment of the information provided by the Applicant and information developed independently by the staff including information gathered through consultations with other agencies.

The U.S. Army Corps of Engineers, or Corps, fully participated with the staff as a cooperating Agency in preparing the Turkey Point EIS under the terms of an existing Memorandum of Understanding between the NRC and the Corps.

The specific roles of the NRC and Corps for preparation of the EIS on the Turkey Point application are set forth in a Memorandum of Agreement between the NRC, the Corps and the National Park Service.

As a member of the Environmental Review team, the Corps staff participated in site visits, consultations with other agencies and development of the draft and final EIS.

In addition, the National Park Service participated in the environmental review as a cooperating Agency under the Memorandum of Agreement previously noted.

The National Park Service provided special expertise for the areas in and around the adjacent Biscayne and Everglades National Parks.

However, only the NRC and the Corps have specific regulatory actions related to the proposed Combined Licenses as explained in the Memorandum of Agreement, therefore, NRC and the Corps also referred to as the Review Team made the impact determination in the EIS and these impact determinations should not be attributed to the National Park Service.

Slide ten, please?

The NRC began the environmental process for the Turkey Point COLA by publishing a Notice of Intent to Prepare an EIS and conduct scoping in the Federal Register on June 15, 2010.

Two scoping meetings were held to obtain public input on the scope of the environmental review

in Homestead, Florida on July 15, 2010.

Furthermore, staff contacted federal, state, regional and local agencies and federally recognized Indian Tribes to solicit comments.

Staff considered all the comments received during the scoping process and developed responses for each comment. The responses are documented in the scoping summary report and also in Appendix D of the EIS.

To prepare the draft EIS, the staff carried out independent analyses and evaluations based on information provided by the Applicant which included supplement or clarifying information in the form of responses to Requests for Additional Information.

The staff considered information from federal, state, Tribal, regional and local agencies and independent information sources that we developed.

Slide 11, please?

All the information gathered during the scoping phase was analyzed and used to prepare the draft EIS which we published in February of 2015.

The public comment period ended on May 22, 2015. The public -- on May 28, 2015, the NRC published a Notice reopening and extending the comment

period from May 22, 2015 to July 17, 2015 to allow more time for members of the public to develop and submit comments.

The staff held three public meetings to describe the results of the environmental report to provide members of the public with information to assist them in formulating comments on the draft EIS and to respond to questions and accept comments.

The first meeting took place on April 22, 2015 in Miami, Florida. The second and third meetings took place on April 23, 2015 in Homestead, Florida.

All comments received on the draft were considered in preparing the FEIS and are documented in Appendix E of the EIS.

Slide 12, please?

On October 28, 2016, the staff published the FEIS as NUREG-2176. However, shortly after publishing NUREG-2176, the staff identified 59 comment letters received during the comment period that were inadvertently not addressed in the FEIS.

None of these comments changed the Review Team's analyses or conclusions in the FIES. To address these comments and to further the purposes of the National Environmental Policy Act, the staff issued a supplement to NUREG-2176 on December 2, 2016

in accordance with 10 CFR 51.92.

The staff did not request comments on this supplement because the inadvertently omitted comments did not provide new and significant information bearing on the proposed action.

As stated in the FEIS, the staff's recommendation related to the environmental aspects of the proposed action is that the COL should be issued.

The staff based its recommendation on the Turkey Point COLA environmental report, consultation with federal, state, Tribal and local agencies, the team's independent review, the consideration of public comments received on the environmental review and the assessments summarized in the EIS, including the potential mitigation measures identified in the environmental report and the EIS.

This recommendation also rests on the staff determination that none of the alternative sites assessed is obviously superior to the Turkey Point site.

Slide 13, please?

The staff included a draft summary record of decision as a reference in the SECY. This document states the decision being made and identifies all alternatives considered in reaching the decision.

The draft summary record of decision also discusses preferences among the alternatives and states whether the Commission has taken all practicable measures within its jurisdiction to avoid or minimize environmental harm from the site selected.

Slide 14, please?

The next few slides list environmental findings pursuant to 10 CFR 51.107(a) that the Commission must make to support the issuance of the Turkey Point Units 6 and 7 COLs.

The staff believes that the scope of the environmental review, the methods used to conduct the review and the conclusion reached in the EIS are sufficient to support a positive Commission determination regarding these findings.

To satisfy the first finding as detailed on this slide, the staff's environmental review used a systematic interdisciplinary approach to integrate information from many fields, including national, natural and social sciences as well as environmental sciences in accordance with NEPA Section 202(2)(a).

The staff's review also comports with NRC's requirements in Subpart A of 10 CFR Part 51.

Staff concludes that the environmental findings in the EIS constitute the hard look required

by NEPA and have reasonable support and logic and fact.

In accordance with NEPA Section 102(2)©, the EIS for Turkey Point COLs addresses the environmental impact of the proposed action, any avoidable adverse environmental effect, alternatives to the proposed action, the relationship between local short-term uses of the environment and the maintenance and enhancement of long-term productivity and any irreversible and irretrievable commitments of resources that would be involved in the proposed action, should it be implemented.

As support by correspondence presented in Appendices C and F of the EIS, the staff concludes that the requirement of NEPA Section 102(2)© was fulfilled in part by consulting with and obtaining comments from other federal agencies with jurisdiction by law or special expertise.

As noted earlier, the Corps fully participated with the NRC as a cooperating Agency in preparing the EIS and the National Park Service also participated as a cooperating Agency by providing special expertise with the areas in and around the nearby national parks.

In accordance with NEPA Section 102(2)(e),

the staff concludes that the EIS Chapter 9 demonstrates that the staff adequately considered alternatives to the proposed action.

The alternatives considered in the EIS include the no action alternative, site alternatives, energy alternatives, system design alternatives and mitigation alternatives for severe accidents.

To satisfy the second and third findings which appear on this slide and the next, Chapter 10 of the EIS provides the staff's cost-benefit assessment which considered conflicting factors such as the need for power as well as reasonable alternatives to the proposed action.

Slide 15, please?

Based on that analysis, the staff concluded that the construction and operation of the proposed Turkey Point Units 6 and 7 would have accrued benefits that would be expected to outweigh the economic, environmental and social costs.

As a result, the staff recommends that the COLs be issued.

For the fourth finding, the staff believes that the Commission will be able to find after this hearing that the NEPA review performed by the staff has been adequate.

The staff performed a thorough and complete environmental review sufficient to meet the requirements of NEPA and adequate to inform the Commission's action on the requested COLs.

I'll now turn this presentation back over to Vonna.

MS. ORDAZ: Thank you, Jennifer.

That completes the staff's overview.

Thank you, Chairman

CHAIRMAN SVINICKI: Well, thank you very much to the witnesses for the staff's overview presentation.

And, Jennifer, I want I want to thank you for stepping in on short notice for you colleague. I appreciate your willingness to do that here today.

We begin the questioning of this panel with Commissioner Baran. Please proceed.

COMMISSIONER BARAN: Well, thank you for your presentations. I actually don't have any questions for this panel, so I'll reserve my time.

Thanks.

CHAIRMAN SVINICKI: All right, thank you.

Commissioner Burns?

COMMISSIONER BURNS: Oh, thank you, Chairman.

Thank you to the staff witnesses for their presentations here this morning and as the Chairman said, for Jennifer for stepping up to the plate here.

Just a couple things in the nature of the overview since that's where we are at is the overview panel.

I think as Frank or Vonna may have said, we have issued eight AP1000 COLs to other applicants that have preceded FP&L here today.

And, again, as the answer to -- and elicited out of the -- from the first panel in terms of my question with respect to Part 52 process, part of this is in the design and intention of Part 52 is to enhance standardization across the fleet to improve the efficiency of licensing reviews and to reach -- in order to reach the necessary conclusions under the various statutes of the Atomic Energy Act as well as NEPA and others in making licensing decisions.

So, sort of at a high level, if you'd say, again, looking at going through the process where an applicant invokes the standardized design, what were the areas where the deviations from it or either deviations or a unique challenges that you think you faced with respect to this application, recognizing it starts out with a reference to a standardized design?

MR. AKSTULEWICZ: So, it's a great question, Commissioner.

I think you have to step back and look at the context in which this application arrived to kind of answer the lesson learned.

We were in the midst of a design certification review in parallel with the COL review. And, I think one of the key lessons learned is that particular combination of activities is very challenging for the COL applicant, not only the staff, to try to maintain its application contemporary with whatever the design changes are that are happening with the certification as it's under review.

Once you set that aside, I think we have seen, aside from the issues that Mr. Maher raised which was how to deal with issues that are identified during the construction of units while other units are under review, I think that's still an issue that we're -- we have a handle on, but we're still trying to figure out what's the most efficient and effective way to deal with those matters.

And we have meetings with the industry that were set up to discuss how to deal with those in the near future as a matter of fact.

And then, the third part is, I think I can

speak very candidly to how the nature of the review has evolved.

And, we have -- the purpose of a Part 52 was to focus on truly those site specific and unique matters.

And, I think as we've progressed along through the AP1000s, we've seen how those issues have narrowed to really just the site specific matters.

And, I think that has been a benefit, not a problem. But, clearly, the intent of the rule as it was structured, and we've seen that play out in the review process late in this particular application.

COMMISSIONER BURNS: So, to paraphrase what I think I heard you say is that we're -- as our experience has grown it really -- the model of focusing on site specific matters, we really have achieved that or are doing a better job at that, I think. I don't mean to put words in your mouth, but I think that's what hearing you say.

MR. AKSTULEWICZ: Yes, Commissioner, that's actually correct.

And, we've seen it to a lesser degree in the ESPWR design center because there's only two plants --

COMMISSIONER BURNS: Right.

MR. AKSTULEWICZ: -- in that center. But, here, where there has been a progression of activity over time we have seen the benefits play out.

COMMISSIONER BURNS: Yes, and just to reflect on one of your comments, again, if we go back in time and the vision of how Part 52 would work, I think it was -- because you alluded to in your testimony just now, you alluded to the fact that one of the difficulties for the staff as well as applicants is an ongoing design certification review at the same time you're trying to engage an applicant in the COL.

So, in this particular circumstance, as I recall, we had the amendment or significant amendment to the AP1000 pending before the Agency while -- and then it achieved or basically approved, as I recall, December 30 it was published in the Federal Register, December 31, 2001 for the AP1000 amendment.

But, at that time, it's that parallel activity which has some -- poses some challenges to the staff as well as the applicant, correct?

MR. AKSTULEWICZ: Yes, sir.

COMMISSIONER BURNS: Yes. Again, my -- the -- I think the expectation, we go back to the mothers and fathers of Part 52 was this more

methodical we would have a design certification and then people would go into the shop and pick things off -- pick it off the shelf, right?

MR. AKSTULEWICZ: That's correct.

COMMISSIONER BURNS: Okay, thank you.

One last question I have, in prehearing question two, the Commission asked the staff about the construction cost estimates in the application.

And, a response the staff stated, estimates produced by applicants are, quote, order of magnitude costs estimations for high level planning purposes only.

And, that order magnitude estimates, quote, typically provide a point estimate cost within a plus or minus 50 percent range, unquote.

Is this a practice the staff has typically accepted in the past for cost estimates for similar projects?

MR. AKSTULEWICZ: So, I know what I don't know and I don't know that. So, I'm going to ask Dan Mussatti to come up and answer your question.

COMMISSIONER BURNS: That's fine, that's fine.

CHAIRMAN SVINICKI: And, again, as you approach the podium, please identify yourself, your

organization and indicate if you've been sworn as a witness. Thank you.

MR. MUSSATTI: My name is Daniel Mussatti and I have been sworn in. And, I'm with the DSEA Environmental Group.

CHAIRMAN SVINICKI: Thank you.

MR. MUSSATTI: The question, again, is?

COMMISSIONER BURNS: Well, has this order of magnitude cost estimates, is this typical of what we have used in the past in our assessments on the financial qualifications?

MR. MUSSATTI: Yes, it is. This is a standard use throughout the cost estimating industry.

COMMISSIONER BURNS: Okay.

Can you describe, just at a high level, how we use those types of estimates in our review? How do they inform our decisions on the financial qualifications?

MR. MUSSATTI: Well, the NRC doesn't use the financial information that we gather for the cost estimation for any sort of commerce purpose. The only thing we're interested in is in resolving the questions that are safety related for nuclear materials.

And, in particular, question number four

from Chairman Svinicki's list of five safety questions that she brought up at the beginning of the meeting today, consequently, the numbers that we use here are very, very high level number that are just to give us a general range as to where those costs are.

They're typically produced by engineers very, very early in the planning stage. They don't have a great deal of idea as far as what the blueprints are going to look like, where the plant is exactly going to be sited.

The estimation is made based on similar projects elsewhere that have been boiled down to a dollars per megawatt level and then extrapolated back on to the project. So, it's a very rough estimate.

It's also considered an overnight cost estimate in that we don't take into consideration any sort of financial costs for the longevity of the project. We don't anticipate any sort of costs involved in materials escalating in price over time or anything like that.

It's a very -- it's a very antiseptic cost but this is the one that the industry uses.

COMMISSIONER BURNS: Okay, thank you.

Thank you, Chairman.

CHAIRMAN SVINICKI: Okay, I just have a

couple of questions for this panel.

I'll begin by kind of building off the foundation of what Commissioner Burns was talking about on the -- he has a little bit more history with Part 52 than I do.

But, my understanding of the purposes of the benefits of one-step licensing are the same as what he's articulated.

And, he talked about having a certified design and marrying that even perhaps with an early site permit and those efficiencies in the process that would yield a COL review that would be expected to take a shorter period of time.

Another efficiency I believe institutionalized in Part 52 is the notion of the design centered working group so you have a reference COL review that goes through and then a subsequent -- we've mentioned that for AP1000s, that's probably the richest body of experience that we have as a regulator in reviewing those.

But, if we look at the numbers provided by staff in the mandatory hearings for the AP1000, the COLs that reference the AP1000, we see that there's just a strong variability, if my numbers are accurate, I think my staff described the transcripts from the

mandatory hearings.

For instance, Vogtle which would be your reference case, well, after it hopscotched around some other applicants, it ended up being the Vogtle application.

But, as approximately 31,000 hours, Summer at 17,000 hours. So, there, you say to yourself, oh, okay, well, that makes sense then, they were very close together in time, a lot of similarities. So, I'm sure we were harvesting various staff efficiencies of having people working on both.

But, then, you get to some of the ones that were a little bit further out. You've got 83,000 hours, 67,000 hours.

So, and I say this not in any way to find fault with the review. Obviously, the Commission has determined the staff's review of all those previous matters to be adequate and thorough.

And so, what would the staff characterize, though, as kind of the scatter plot of the data there? Is it the uniqueness that you still -- the novel issues you find with each COL even if they are an S-COLA application?

And, Frank, I know you've got a lot of run time on all these matters. Is there any working

hypothesis you have about why you don't see a strict linear gain in efficiency on the S-COLA reviews?

MR. AKSTULEWICZ: Sure, thank you, Chairman.

I think the way I would characterize it is, each of the applications had some unique issue that was unanticipated. And, I think you can look at Lee Station which is an example of a high seismic response area following the earthquakes. Right?

And so, the whole reconstruction of the Central and Eastern U.S. seismic capability factored into a reanalysis of that particular application that was unanticipated.

With the present application, it had its own unique characteristics whether it be water resource issues, with the Park Service issues, with seismic or foundational issues, I'll say.

So, it's hard to predict whether or not those issues are going to be easily resolvable and whether it's going to show that there will be some direct linear relationship or some centralization of a scatter plot on resources from application to application.

CHAIRMAN SVINICKI: In your direct experience with these AP1000 COL applications, do you

think that if it were possible to extract out those unique issues, do you conclude that there is an efficiency in being a subsequent COLA, might not be reflected given the few data points we have, but say, if you were doing 30 or 50 of them, there would be a clear ability to see that the reference COLA and subsequent COLA structure does yield efficiencies?

MR. AKSTULEWICZ: So, I believe that if you could do that, you would find that efficiency.

My own personal experiences, when we were transitioning from the Phase II to Phase IV to Phase VI or, in this case, Phase B to D, you could see the ease at which the safety evaluation was being developed and those areas where there were no ongoing reviews because everything was either standard language from a previous application that had been approved or was part of the certification that all you were dealing with were those very specific chapters that were site specific.

CHAIRMAN SVINICKI: And, the phases for those who aren't familiar is that the NRC staff undertakes a phased review. Could you just describe that briefly?

MR. AKSTULEWICZ: Sure.

So, for a reference COLA, we use a six

phase review. The first phase is a Request for Information. The second phase is the development of a safety evaluation with open items.

A third phase is an ACRS review. A fourth phase is the completion of the safety evaluation by closing all of the open items.

The fifth phase is a revisiting with the ACRS again on matters that were open at the time.

And, the sixth phase is the final reconciliation of all outstanding issues in terms of a confirmatory nature that completes the licensing record for the application.

For a subsequent COLA, we use a four phased A, B, C and D. A is very similar to Phase I, it's a question and answer response phase.

Phase B is the development of the safety evaluation with open items.

Phase C is a visiting with the ACRS on matters of technical nature.

And, Phase D is the completion of the safety evaluation that resolves all open issues.

CHAIRMAN SVINICKI: Okay, thank you for that.

The other topic I would ask you to perhaps to respond, anyone on the panel who would like to, is

you heard in the panel immediately preceding yours, I asked the Applicant about kind of institutional knowledge keeping that together on a going forward basis.

And, the cases -- the case of the NRC staff, of course, is the Commission has approved to the merge of the Office of New Reactors with the Office of Nuclear Reactor Regulation. So, you know you're facing a restructuring on the NRC side of the house.

So, how is the staff, at a high level, approaching the same need to maintain a core and institutional knowledge should applicants, upon being granted licenses, decide ten years down the road to construct -- to initiate construction of the units?

MS. ORDAZ: Thank you.

I would offer that we have a number of procedures in place currently. They have been revised over time and they're going to continue to be revised as we're learning lessons through these reviews.

Many of the staff that have been involved through the years, I would offer Frank to my right here, has been involved since day one.

I've had some experience in the past four hearings and but the staff behind us and around this

room, I asked this morning when we did roll call for the witnesses, how many have been involved up to this point. And, there was quite a few hands in the air. So, many of the folks around this room have been involved since the very first time and also have had been here -- have been here for previous hearings.

So, we can't always declare that they're going to be here in future COLs, however, and there are no future ones on the horizon at the moment, but what we're trying to do is ensure that the procedures that we have in place continue to be updated, learning lessons.

And, when we take the opportunity, continuously to look back and factor those lessons into our procedures such that is there is that opportunity for a future COLs, we'll have turn over, we'll have dialogue and we'll be able to preserve knowledge.

CHAIRMAN SVINICKI: Thank you for that.

And, I would note that upon the issuance of the Commission's decision in this particular mandatory hearing, NRC does and new reactors achieves a significant milestone in the wrapping up of their work on the pending COL.

So, I think we will hit a different phase

here in terms of keeping institutional knowledge. And, we will, of course, make use of the very capable team that has worked on this in other capacities and as they move on to different assignments, we'll have the same challenge as the Applicant.

So, we'll have to maintain some focus on that. Of course, the notion of maintaining institutional knowledge is not something new for NRC. We do this on the operating reactor side and with other materials licensees. So, I'm very confident that the NRC staff will be able to keep the right knowledge management instruments in place.

With that, I would note, if my colleagues don't -- haven't thought of anything else that they care to raise, we will now take a short break. And, I think I'm going to give us until quarter to so that we may reset for the first safety panel and stretch our legs a bit.

So, we will reconvene at 10:45.

Thank you.

(Whereupon, the above-entitled matter went off the record at 10:36 a.m. and resumed at 10:45 a.m.)

CHAIRMAN SVINICKI: Thank you, everyone. I now call the hearing back to order. We will now

conduct the Safety Panel, which as I have described is the first of the joined panels that will begin with the FPL witnesses and then continue with the NRC staff witnesses.

The parties will address relevant sections of the application and two chapters in particular from the Final Safety Evaluation Report, Chapter 2 regarding site characteristics, including a novel issue associated with storm surge and sea level rise, and Chapter 11 regarding radioactive waste management, including a novel issue associated with the use of deep well injection for liquid radioactive waste disposal.

In connection with the staff's discussion of the liquid rad waste disposal issue I note that in the contested portion of this proceeding, which proceeded separately from today's hearing and has been completed, the Atomic Safety and Licensing Board considered an environmental issue designated contention 2.1.

The proponents of that contention argue that certain specified chemical concentrations in the wastewater proposed to be injected into the wells could adversely affect groundwater should they migrate into the Upper Floridan Aquifer and that the staff's

Environmental Impact Statement therefore incorrectly concluded that the environmental impacts from the wells would be small.

Following an evidentiary hearing on this contention the Licensing Board concluded in a decision designated LBP17-5 that the staff did in fact demonstrate that the environmental impacts from the injection wells would be small.

This specific issue has been finally determined and is not part of the Commission's consideration of the staff's review in the uncontested portion of this proceeding.

I will now begin by asking the panelists to introduce themselves, and we will begin with FPL. Please proceed.

MR. FRANZONE: Good morning. This is Steve Franzone, Licensing Manger.

MR. JACOBS: Paul Jacobs, Engineering Supervisor.

MR. ORTHEN: And Richard Orthen, Licensing Engineer.

CHAIRMAN SVINICKI: Thank you. Please proceed with the FPL presentation.

MR. FRANZONE: Good morning, Commissioners, this is Steve Franzone. Slide 2,

please. Okay.

If I may draw your attention to the blue at the bottom right of the figure on Slide 2 this represents the nominal sea level of Biscayne Bay and 26 feet above that is our plant design grade.

To paint the final plant design grade we started by reviewing different scenarios identified in NRC guidance, such as floods, rains, tsunami, and storm surge.

The limiting event which could impact this site was determined to be the probable maximal storm surge. If we look at the figure it identifies the three components of the surge water level.

First we need a sea level which to base our storm surge computation. We have conservatively used an antecedent water level of 3.6 feet NAVD-88, which is the elevation standard.

The two components which make up this value are the 10 percent exceeding high spring tide and an added one foot projection for sea level rise. The one foot for sea level rise was calculated by using the local relevant data to determine the actual trend for South Florida following NRC guidance.

We used data from the closest available tide station to determine our sea level rise and

reviewed more recent data from tide stations that were farther away to see if there was a higher rate of change in the more recent data.

We were able to confirm our value was conservative. Accordingly, this adjusted initial water level condition was then used in our surge model simulations.

The analysis of the controlling storm surge included parameters such as storm track, wind feels, direction of wind approach, and bottom effects, and resulted in a value of 17.5 feet.

These parameters exceeded the documented historical parameters at the site. We conservatively added a factor of 20 percent for uncertainty to the model results.

We showed that the model accurately represented site conditions by benchmarking using events such as Hurricane Andrew. Our last component of our surge water level is wave run-up.

Wave run-up is calculated using a conservative model which yield a value of 3.7 feet. Therefore when we add these components together that equals 24.8 feet, that we then added 1.2 feet of additional conservatism to obtain the plant design grade of 26 feet.

In conclusion, NRC guidance provides a conservative method for determining the potential surge for a site by adding conservatism to each individual component, the result is a conservatism plant design elevation.

Slide 3, please. Okay. All wind is not created equal. For other sites the DCD site parameter value of 300 mile per hour tornado wind speed is the limiting site characteristics.

Based on new NRC guidance we investigated missiles generated by hurricane winds which had the potential for our site to be more limiting than missiles generated by a tornado due to the straight line winds in a hurricane.

We reviewed potential hurricane missiles generated by our one in 10 million year hurricane wind speed of 260 miles per hour which was taken from their figure you see here.

Using the same methodology as described in the DCD the hurricane missiles were evaluated and found acceptable. Another wind design parameter is the operating basis wind speed which is used to establish the loads which could be applied repeatedly without interrupting operation.

We determined for our site that basic wind

speed is approximately 150 miles per hour, which is five miles per hour greater than the DCD value of 145 miles per hour.

These are the winds expected to occur every 50 years. However, since the wind loads are a small contribution to the total applied loads to plant safety-related structures the small increase is acceptable.

And, finally, for Turkey Point 6 and 7 and likewise for the existing units we will actually shut down the plant in advance of the site being impacted by Category I hurricane winds, which translate to sustained winds of 74 to 95 miles per hour in accordance with our emergency plan.

Thank you. I will now turn the presentation over to Paul Jacobs, our Engineering Supervisor.

MR. JACOBS: Good morning, Commissioners. Slide 4, please. Let's see. As Steve mentioned earlier FPL proposed a different method of liquid effluent discharge for Turkey Point Units 6 and 7.

The process for collecting plant waste streams performing the required dilution and the release of the waste stream is standard practice for all plants.

The difference for Turkey Point Units 6 and 7 is rather than releasing the waste stream to surface water we will release the waste stream to the boulder zone.

The boulder zone is an extremely permeable zone in a southeast region of Florida that is capable of receiving large liquid waste quantities.

The use of the boulder zone for injection of treated sewage, industrial and domestic waste, is permitted by the Florida Department of Environmental Protection.

The boulder zone is overlain by a confining unit which will prevent upward movement of the injected waste. The boulder zone has been in use for disposal of liquid waste since 1943 and there were over 180 permitted Class I injection wells.

The basic construction of the injection well consists of a series of concentric casings that are placed at various depths. Each of the casings is cemented in place to isolate the various geologic zones.

The depths of each size of casing are determined by the geology of the site and Florida regulatory requirements. The 24-inch and 34-inch casing is placed to provide double protection of the

underground source of drinking water.

FPL will install six pair of injection wells. Each pair of injection wells will have a dual zone monitoring well. The dual zone monitoring well is an early detection system used to identify if injectate is migrating upward from the boulder zone.

Slide 5, please. Slide 5 contains a cross section of a typical deep well injection arrangement, well arrangement. The figure is not to scale and is intended to point out significant features of the well system.

This official well shown in the upper left is simply shown for scaling purposes. The system shown includes and injection well, IW-1, and an associated dual zone monitoring well, DZMW-1.

As shown the injection well extends from grade to approximately 3000 feet below land surface. The actual depth of the injection well system that will be installed at Turkey Point will be determined for each well based on the specific well site but should be between 2900 and 3500 feet below land surface.

To offer some perspective I would like to point out some of the relevant elevations to demonstrate the features that make the use of these

wells a safe and reliable method of release.

The base of the underground source of drinking water is approximately 1450 feet below land surface. The injection elevation is 3000 feet below land surface.

Between the injection point and the underground source of drinking water is an area designated as the Middle Floridan Confining Zone. The layer is approximately 1000 feet thick and has a very low hydraulic conductivity that prevents flow through the confining layer.

The likelihood of any fluid from the injection zone rising into the underground source of drinking water is very small because the confining layer is thick and has low porosity.

Mr. Orthen will now describe the assessment FPL performed to determine how injection might affect the safety of members of the public.

MR. ORTHEN: Slide 6, please. Good morning. I will now talk a bit about FPL's work assessing the public safety implications of a non-traditional method of disposing the plant's radioactive liquid effluent using the injection wells Paul just described.

The combination of the natural barriers

preventing access to this deep saltwater formation coupled with relatively stagnant movement of water down there make this formation a very attractive alternative to surface water disposal.

These features quite simply minimize the prospects for human exposure and for the reasons Paul described we would not expect any member of the public to ever come in contact with this water.

But the NRC asked the question what if and so FPL conducted an extremely conservative dose assessment to demonstrate compliance with the NRC's 10 CFR 50 Appendix I ALARA dose objectives under highly unlikely circumstances.

Because dose assessment methods for effluents released to surface water are not directly applicable to subsurface injection FPL developed a new modeling approach coupling groundwater transport in sites with traditional maximally exposed member of the public dosimetry approaches.

We developed several receptor exposure scenarios along the way postulating extraordinary events and assumptions, abnormal situations if you will, in order to hypothetically and maximally expose a member of the public to the injected effluence.

These abnormal situations were needed

because the ordinary expected injection practice would confine for decades the effluent within the saltwater formation with no reasonable or practical means for exposure. Then we decided which of these abnormal situations would deliver the highest dose.

In summary, FPL's modeling design was conservatively established to define a very unlikely sequence of events and human activities associated with an abnormal, highly unexpected exposure situation.

Through a careful screening and selection process FPL found that the worst case scenario involved an unusual person who is both a well driller and a subsistence farmer living about two miles away from Units 6 and 7.

FPL hypothesized that in this particular situation the subsistence driller would ignore all notification and permitting requirements for a large and expensive drilling operation and develop a well hundreds of feet deep into the brackish Upper Floridan Aquifer to supply water for drinking and production and consumption of food stuff, such as garden vegetables, beef, and milk.

To add to this conservatism we placed this well directly above a hypothetical failure in the

lowermost confining barrier above the saltwater disposal formation, in essence, short circuiting direct access to the Unit 6 and 7 effluence.

Despite this being a worst case situation and an extremely unlikely scenario the subsistence driller's dose was found to be less than a few millirem per year, in compliance NRC's Appendix I limits.

Because the slow horizontal movement of effluent in a saltwater formation also ensures long periods of radioactive decay before arriving below the subsistence driller's location we are confident this analysis is both conservative and bounding.

Slide 7, please. This ends my presentation. Thank you.

CHAIRMAN SVINICKI: Thank you. I would now ask the NRC staff panelists to please occupy the spaces behind their name cards. Please introduce yourselves and proceed with the staff's presentation. Thank you.

MR. COMAR: Good morning. I am Manny Comar.

MS. SMITH: Good morning. Ellen Smith.

MR. GIACINTO: Good morning. Joseph Giacinto.

MR. GRAN: Zach Gran with Health Physics.

MR. COMAR: Good morning, Commissioners. My name is Manny Comar and I am the Lead Project Manager for the staff review of Florida's Turkey Point Units 6 and 7 Combined License Application review.

Slide 2, please. Joining me on the safety panel are Joseph Giacinto and Mr. Zachary Gran of the NRC staff and Ms. Ellen Smith of the Oak Ridge National Lab.

Slide 3, please. During this panel Mr. Giacinto and Ms. Smith with discuss the storm surge and sea level rise and Mr. Gran will discuss deep well injection for the liquid radioactive waste disposal.

I will now turn over the presentation to Mr. Joe Giacinto and Ellen Smith.

MR. GIACINTO: Thank you, Manny. My name is Joseph Giacinto and I am NRC's Lead Hydrologist for the staff's review of the Turkey Point Units 6 and 7 Combined License Application.

With me is Ms. Ellen Smith who is a hydrologist on the research staff at Oak Ridge National Laboratory. Our testimony will focus on the external flood causing mechanism of storm surge and its related components.

Within 10 CFR Part 50 Appendix A General

Design Criterion II requires consideration of the most severe national phenomena historically reported for this site and surrounding area in establishing the plant design basis.

In regard to the potential for external flooding from storm surge the storm surge resulting from Hurricane Andrew in August of 1992 remains the highest of record in the State of Florida, including consideration of preliminary data on the recent series of 2017 hurricanes.

Hurricane Andrew was a Category 5 storm which is the most severe hurricane category with associated winds of 157 miles per hour or greater. Passing through Homestead, Florida, Hurricane Andrew made landfall approximately eight miles north of the Turkey Point site.

The hurricane produced a maximum storm surge of 15.4 feet north of the site and a storm surge elevation of three to four feet at the Turkey Point site.

We will move on to the staff's review of the storm surge analyses with the next few slides presented by Ms. Ellen Smith.

MS. SMITH: Thank you, Joe. Good morning, I am Ellen Smith, a hydrologist at Oak Ridge National

Laboratory and the Lead Technical Reviewer for surface water in support of NRC's staff review of the Turkey Point Units 6 and 7 COLA.

Slide 5, please. FPL's analysis for storm surge modeled a Probable Maximum Hurricane, or PMH, consistent with NRC guidance and Standard Review Plan 2.4.5 of NUREG-0800 using the combination of hurricane parameters that yields the highest storm surge at Turkey Point.

This PMH is much more severe than Hurricane Andrew. The calculated storm surge height from this PMH was then increased by 20 percent to account for uncertainty.

The staff confirmed FPL's modeling results and confirmed that the FPL analysis also includes other conservatisms specified by NRC guidance. Specifically, the analysis used as the peak surge that occurs in an extreme high tide coincident with the highest recorded sea level anomaly in the area and that includes an allowance for sea level rise, which is discussed in the next slide.

Wave run-up on top of the surge was calculated as 3.7 feet based on using conservative straight line constant winds from a storm with wind speeds higher than the threshold for a Category 5

hurricane.

The resulting total flood hazard elevation from storm surge was calculated to be 24.8 feet at the site, which is 1.2 feet below the design grade of 26.0 feet. An ITAAC requires FPL to verify the design plant grade elevation.

Slide 6, please. Sea level rise is one component of the storm surge calculation, which is expanded upon in this slide.

NRC guidance and Standard Review Plan 2.4.5 indicates that information from sea level records should be considered in flood analysis for coastal sites and JLD-ISG-2012-06 recommends using observed sea level trends at nearby tide gauge stations as a basis for estimating sea level rise, future sea level rise.

The National Oceanic and Atmospheric Administration, or NOAA, maintains a network of tide stations and publishes tide and sea level data from those stations.

Miami Beach is the nearest station to the Turkey Point site that has a period of record long enough to span multiple multi-decade tidal cycles. NOAA's data analysis shows that sea level there is rising at a rate of 0.78 feet per century.

NRC staff reviewed the data and the analysis and confirmed this trend. The Miami Beach station was removed from service in 1981 but Transit Miami Beach are well correlated with Transit Key West where NOAA tide records are available from 1913 through 2016.

Informed by the observed data and NRC's guidance FPL estimated a rise of 1.0 foot to account for sea level change over the life of the Turkey Point Units 6 and 7 nuclear plant.

The staff notes that sea level change is observable and gradual, so if sea level rise should exceed this estimate there would be opportunities to reevaluate the situation and take additional action if warranted.

Slide 7, please. In summary, the heights of the various components of the calculated flood hazard elevation are high tide plus sea level anomaly at 2.6 feet, sea level rise at 1.0 feet, storm surge with an added 20 percent uncertainty at 17.5 feet, and wind wave run-up at 3.7 feet, for a total flood hazard elevation of 24.8 feet, which is 1.2 feet below the design grade elevation.

Sea level rise is only one component in this flood hazard elevation and therefore any

discussion of the relative merits of the sea level rise component should also consider any conservatisms from other parameters that contribute to the overall design basis flood height. Thank you. Now to Joe. Slide 8, please.

MR. GIACINTO: Thank you, Ellen. The storm surge estimate exceeds the surge from the most extreme historical event. Considering the multiple layers of conservatism in the storm surge analysis the NRC staff concluded that the design basis value of storm surge flood height is appropriate and reasonably conservative.

Because the design basis flood elevation does not inundate the design plant grade it will not affect safety-related structures, systems, and components.

I will now turn the presentation over to Mr. Zachary Gran for a presentation of deep well injection for liquid radioactive waste disposal.

MR. GRAN: Thank you. Slide 9, please. Good morning.

COMMISSIONER BURNS: Could you move your mic a little closer?

MR. GRAN: Okay. How's that?

(No audible response)

MR. GRAN: Good morning. My name is Zachary Gran and I am a Health Physicist in the Office of New Reactors. I am the lead reviewer for Chapter 11, Waste Management Systems, for the Turkey Point COLA.

I will be presenting the staff's review of the maximum potential dose resulting from the deep well injection method proposed by FPL.

FPL is proposing to use deep well injection to dispose of liquid effluent instead of disposal into surface water. This design feature has been designated as novel as it represents the first use of such a disposal method by a nuclear power plant in the United States.

10 CFR 20.2002 describes the information required for obtaining approval of a proposed disposal method.

Slide 10, please. First, some background on deep well injection. The injection will be into the boulder zone of the Lower Floridan Aquifer which is a cavernous, high permeability, saline zone located over 3000 feet below the surface at the site.

The salinity of water within the boulder zone is roughly the same as sea water. Water within the boulder zone is kept separate from the overlying

brackish Upper Floridan Aquifer by around 1500 feet of low permeability dolomitic limestone and dolomite.

This low permeability zone is referred to as the Middle Confining Unit of the Floridan Aquifer System and is relied upon in Florida to provide confinement of injected wastewaters.

In the vicinity of the site water within the Upper Floridan Aquifer is brackish and would require treatment before drinking.

Slide 11, please. Deep well injection of both municipal and industrial wastewater is widely used in the State of Florida in part because of laws that limit releases to surface water bodies.

Currently there are over 180 deep injection wells, which are also known as Underground Injection Control wells, permitted by the State of Florida under authority delegated from the Environmental Protection Agency.

At the Turkey Point site FPL proposes to install 12 Class I underground injection control wells and six dual-zone monitoring wells located between each injection well.

Slide 12, please. Given the nature of the discharge method it was necessary for FPL to demonstrate compliance with 10 CFR 20.2002, Methods

for Obtaining Approval of Proposed Disposal Procedures.

In past reviews of applications, other than for a power reactor license, the staff has typically approved 10 CFR 20.2002 requests that result in a dose to a member of the public that is no more than a few millirem per year.

For this criterion the staff determined that the criteria present in 10 CFR Part 50 Appendix I were suitable for evaluating dose since these are the criteria used to demonstrate compliance with surface water disposals.

Slide 13, please. The staff performed an independent dose analysis using radionuclide concentrations provided by the Applicant.

The staff independently confirmed that the radionuclide concentrations described by the Applicant as having the highest contribution to dose were conservative.

The staff confirmed that four radionuclides, tritium, cesium-134 and cesium-137, and strontium-90 contribute 99 percent of the dose from the AP-1000 source term.

The staff identified the nearest hypothetical receptor location at 2.2 miles of the

site and staff considered multiple pathways as noted on the slide.

However, the staff's analysis for compliance only used the irrigated vegetable pathway since no other pathway is plausible based on land use practices around the site.

As part of the analysis of the fate and transport of injected effluent from the injection well to the receptor location the staff used conservative primaries and assumptions in order to evaluate the abounding injection scenario.

The conservative assumptions are discussed on the next slide. Slide 14, please. This slide illustrates a conceptual model of the bounding transport scenario which was used to describe the maximum exposure scenario at the receptor location.

On the right side we have the injection well, which is the point at which the liquid effluent is being injected into the boulder zone. Prior to being injected the effluent will be diluted to meet 10 CFR Part 20 Appendix B, Effluent Concentration Limits.

In our analysis the staff used the smaller of the two possible dilution sources because that will result in the highest concentration of radionuclides in the injected effluent.

Once the water is in the boulder zone the staff used conservative assumptions to minimize travel times to receptors and maximize the concentrations of the effluent.

Conservative parameters for dilution, radionuclide decay, sorption, and the aquifer effective porosity and thickness were all used to minimize the travel time to the receptor location.

Staff analysis confirms that the injection pressure would have a greater influence on plume migration rates than the slow natural flow within the boulder zone and would be the primary mechanism driving transport for radionuclides once inside the boulder zone.

Accordingly, the staff determined that the maximum radionuclide concentrations at the receptor well and for this does analysis the staff used the maximum concentration determined for each radionuclide.

At 2.2 miles from the site staff assumes that there is a private well completed in the Upper Floridan Aquifer located directly above a complete breach of the Middle Confining Unit.

This assumption is conservative since the staff analysis has determined that over the 100-year

simulation the effluent would not travel more than 310 feet vertically through the 1500-foot confining unit.

The staff then calculated the dose to a member of the public through the irrigated vegetable pathway using the concentrations found at 2.2 miles in the boulder zone.

Slide 15, please. Based on the staff's analysis the staff determined that the calculated releases were below the limits specified by 10 CFR Part 20 Appendix B and 10 CFR Part 50 Appendix I.

The Health Physics Program required by Part 20 and the ALARA Program required by Part 50 Appendix I are both operational programs and do not have associated ITAAC in accordance with the staff requirements memorandum on SECY-04-032.

The Applicant demonstrated compliance with 10 CFR Part 20 Appendix B by specifying and maintaining flow rates at the blowdown sump discharge corresponding to the minimum dilution factor of about 6000 gallons per minute per unit prior to discharge.

The staff confirmed the dose results reported by the Applicant through independent calculations. The staff confirmed that the doses were below the dose objectives in 10 CFR Part 50 Appendix I.

And, in addition, the Applicant has provided all of the information needed to demonstrate compliance with 10 CFR 20.2002 by, one, providing a description of the waste disposed and the manner of the disposal, and, two, demonstrating compliance with the limits of 10 CFR Part 50 Appendix I and the maximum dose criterion of a few millirem to the maximally exposed individual.

This concludes the staff's presentation. Thank you.

CHAIRMAN SVINICKI: Well thank you to the FPL and the staff panelists for those presentations. This is the part of the day, this part and the next panel where the room layout creates a slight bit of awkwardness but I know we can handle it, so we do have the FPL witnesses behind the staff.

I don't think you need to move yourselves all the way. I think that there is few enough of everybody that we can --

(Simultaneous speaking)

CHAIRMAN SVINICKI: Okay, all right. Well Commissioner Baran has a blocked view, but okay.

COMMISSIONER BARAN: That's good. You're good, you're good, you're good.

CHAIRMAN SVINICKI: Okay. And we will

begin the question period of this Safety Panel with Commissioner Burns. Please proceed.

COMMISSIONER BURNS: Well, thank you. Thank you for the overview on those two issues, on the deep well injection as well as the -- I think it was a very interesting issue in terms of designing to accommodate, or, you know, a severe, potentially severe flooding events and severe weather events given the experience of Turkey Point being in that very strong hurricane, Hurricane Andrew in 1992.

Let me actually start with a couple questions related to the deep well injection. I have one for the Applicant and then one for the staff.

For FPL, I think in the response to Pre-Hearing Question 18 on requirements associated with the deep well injection you discussed groundwater monitoring requirements imposed by the Florida Department of Environmental Protection and you stated that "it's expected that mechanical integrity tests in the injection wells will be performed every five years."

Can you tell me whether those tests are required by the Florida Department or is there some other commitment that FPL is making toward those testing, that testing?

MR. JACOBS: The license for the injection well is renewed on a 5-year basis and prior to that renewal you do a mechanical integrity test.

COMMISSIONER BURNS: Okay.

MR. JACOBS: So it is required by regulations.

COMMISSIONER BURNS: And that's, right, that's required by the Florida Department?

MR. JACOBS: By the environmental protection regulation, yes.

COMMISSIONER BURNS: Okay, all right. Thank you, that answered my question. And with respect to the staff, as the staff, as Mr. Gran noted I think this is the first circumstance in which we have had for a power reactor licensee, this type of mechanism or this type of design and I guess my question would be that if you, did you have particular guidance for reviewing deep well injection liquid effluence other than what is described in Part 20 and, you know, I think, yes, you also mentioned some documents on Slide 12, was there other experience and other circumstances or industries that you took into account in making your assessment?

MR. GRAN: Yes. Like you point out the few millirem criteria is where started off.

COMMISSIONER BURNS: Yes.

MR. GRAN: We're trying to assess the dose criteria. For normal reactors with the service water disposal we had our, we previously had our computer codes that we would use to do those dose analysis and we could leverage some of the dose conversion factors, the consumption factors, all these various injection pathways to determine the dose.

For this one it was definitely a bit different. I can only speak from the radiological point of view and maybe the -- If you want more details on the water transport we can refer to someone else, but for us it was really how we get the concentrations in the boulder zone.

But once we figured out what the radioactivity was inside the boulder zone determining the dose to a member of the public was somewhat similar to what we normally would do.

COMMISSIONER BURNS: Okay. Okay, all right. Thank you. Let me turn to some questions related to dealing with storm surge and the impact of weather conditions and potential flooding.

There was some illusion -- or I think actually, Mr. Giacinto, you referred to that we have looked preliminarily at data from the 2017 hurricane

experience, which as you noted I think, I think you testified that it's less, the parameters or the characterization of those events, the hurricane events, is less than that of Andrew, correct?

MR. GIACINTO: That is correct. We looked at the data for the 2017 hurricanes which some of it is preliminary but from the existing data that we have looked at the surge from those 2017 hurricanes was far below anything that PMH would approach.

COMMISSIONER BURNS: Okay. What's the nature, as you said what we have is in effect preliminary data, which doesn't surprise me given these events were only within the last couple of months, what other, what is the data to come and maybe, Ms. Smith, you --

MS. SMITH: Well typically the data on the storm surge from a hurricane event is largely based on places where people found debris.

COMMISSIONER BURNS: Yes.

MS. SMITH: So in the immediate aftermath of the hurricane we did have some tide records where they weren't knocked out. The records in Puerto Rico were largely lost, but the numbers from the gauges are typically less than the numbers you end up with later on when somebody does a detailed retrospective.

The highest value I have seen for storm surge in Florida from this year's hurricanes was a news report indicating about ten feet of surge in the Florida Keys from Hurricane Irma.

The highest measured surge was at Jacksonville and was about 7-1/2 feet above the tide level and then the tide was fairly high, so it was probably in the same order totally when you added tide to surge, but those numbers are well below the kinds of numbers we are talking about.

COMMISSIONER BURNS: Okay. Now would the Applicant have anything it would like to add on this question of where we are in terms of preliminary?

MR. FRANZONE: No, I think you accurately portrayed it though.

COMMISSIONER BURNS: Okay. Perhaps one if I can cut through my notes and find it. Again, Ms. Smith, you talked about sort of historical observations with respect to sea level rise and it was something like about three-quarters of a foot or 0.77, 0.78 feet rise over the, about the last century.

Are there -- In terms of looking at data given, you know, it's something we almost read about in the paper every day issues of sea level rise, two things I would say.

Do we have indications that suggest a greater, a more rapid sea level rise although given in context I think when you say this is something you can watch, or, you know, it's not suddenly you're going to have tomorrow a 3-foot rise in sea level, it's something, it progresses over time, but do we have indications of an acceleration of sea level rise?

MS. SMITH: Well there certainly have been some people who have been reporting observations that indicate a higher rate of sea level rise, but most predications of higher sea level rise are still based on somebody's model analyzing the factors that are expected to lead to the rise.

COMMISSIONER BURNS: Okay.

MS. SMITH: And data interpretation on sea level rise is a lot more complicated than a person might immediately assume.

There are all sorts of factors that create noise in the data so it is very difficult to actually evaluate what is affecting sea level rise on a global scale or locally.

So this is something that is -- We're going to know more in the future, but at the moment the data, the observed data are what we have and the linear fit was the best way we can interpret the

historical data.

COMMISSIONER BURNS: Did you want to add something, Mr. Giacinto?

MR. GIACINTO: Yes, I'd just like to add there have been -- Sea level rise is an evolving science and as such characterization of sea level rise literature by the federal government and also the inter-governmental panel on climate change are published every few years to review the state of the science and new information.

So to that end, NOAA recently published a national climate assessment in 2017 and their likely range of sea level rise to 2100 was one foot to 4.3 feet.

COMMISSIONER BURNS: Say that again for me, please, one foot to --

MR. GIACINTO: 4.3 feet.

COMMISSIONER BURNS: 4.3 feet, okay.

MR. GIACINTO: To 2100, yes.

COMMISSIONER BURNS: And my final question related to that then is given what the staff has analyzed and the models that the Applicant has used and with the staff's conclusions am I correct in assuming that the design parameters used are conservative enough to account for that level of rise?

MR. GIACINTO: Yes, it's very conservative. We have a PMH hurricane with an intensity that has never been seen before in the continental United States, a landfall.

The intensity is well beyond the Category 5 threshold. We have a PMH that is approaching the boundaries of physics quite frankly for the Atlantic Ocean and we assume no weakening of the storm at landfall, which is typically the case for a large storm.

We added extreme high tides to the analysis. The Applicant had a simulation program that actually tends to over predict intense hurricanes, such as the PMH, and on top of that we added the 20 percent margin and we added the sea level rise to that and all resulting in a storm surge that is over nine feet higher and 40 percent greater than the storm surge of record from Hurricane Andrew in Florida.

COMMISSIONER BURNS: Okay. Thank you very much. Thank you, Chairman.

CHAIRMAN SVINICKI: Well thank you again for your presentations. I will begin with a question for the Applicant.

Before I do that though I want to note that the Commission asked a number of pre-hearing

questions to both the staff and the Applicant and I did find that the responses were both thorough and very clear, not that they haven't been in other mandatory hearings, but I want to compliment both parties.

I thought that they were very illuminating and as a result I don't have questions on a number of very important areas, but I think that the record is very strong in those areas.

I did have a couple of items outside of that though. The first for the Applicant is the Applicant adopted an approach of a consolidated technical support center consolidated with the emergency operations facility that would service both the existing nuclear units at Turkey Point and the AP-1000 units if they were constructed.

Now there are technology differences of the AP-1000 with the current generation of operation reactors. What were the pluses and minuses that the Applicant considered in requesting that approach and why did you arrive at your request to have the consolidated center?

MR. FRANZONE: Okay. This is Steve Franzone. Thank you, it's a good question. When you look the site the existing units have been there for

a while, their TSC is located inside the protected area.

When we looked at the new Units 6 and 7 we tried to not just look at Turkey Point 6 and 7 alone because our emergency plan actually we transitioned from an individual site emergency plan to the, I mean an individual unit to a site, and so that was one of the considerations when we looked at placing a tech support center.

We wanted to do it locally, centrally between the both units. We could actually take advantage really of new technology for the existing units since they would be operating at the same time period.

The other thing that we had, we wanted to do was FPL's experience at having, you know, a tech support center combined was -- I thought we had the experience that we thought having a tech support center for all four units would be more efficient in a lot of ways.

It can support an incident at both the 3 and 4, the existing units, and then 6 and 7, so that wasn't a problem. Let me think. I think that generally answers the question.

CHAIRMAN SVINICKI: Okay, thank you. And

for the staff, there is this metric on population density that is considered, it is I think exists in NRC guidance, it's a density criterion of 500 people per square mile for the siting of nuclear power plants and this was somewhat of a complex issue for the staff.

I think that there were -- Well I should back up and say that it isn't really a hard requirement not to exceed the 500 person and it says if the proposed location "significantly exceeds 500 people per square mile" and then it doesn't define significant so the staff has to use some expert judgement there as well.

But could the staff clarify at all what the source of 500 is and how did the staff approach that technical judgement about significantly exceeding 500?

MR. NAZER: I am going to ask Rao Tammara here, to come up to the podium to --

CHAIRMAN SVINICKI: Oh. And, again, as you approach the podium would you state your full name, your organizational affiliation within NRC, and whether or not you have been sworn.

MR. TAMMARA: My name is Seshagiri Rao Tammara. I am with the DSEA, NRO. I am the lead

reviewer for the external hazards in population distribution.

CHAIRMAN SVINICKI: And you have been sworn as a witness? You have been sworn in as a --

MR. TAMMARA: Yes, I am sworn in, yes

CHAIRMAN SVINICKI: Yes, thank you.

MR. TAMMARA: According to the regulation 100.21(h) the regulation says the nuclear unit preferably to be located at a low density area not really highly dense area.

In doing so there is another way, another step you can look at provided not in a dense area if safety environmental and other considerations can be feasible you can locate but the regulation did not specify a value that it should exceed other -- you know, within that point, but they left it that way so that preferably it should not be a very densely area.

But later on when the 4.7 guidance was provided the guidance was given preferably a nuclear unit should be located from the date of the initial approval within five years thereafter the people should be, the density should be within 500 people per square meter within the 20 miles from the reactor site in any radial distance -- average road and radial distance. That was the guidance.

So but the guidance also says if this exceeds not well in excess of 500 you can demonstrate that the safety, environmental, and other considerations are favorable or outweigh the density criterion can be real -- or overlooked.

So that is the gist of the guidance which has given. So if the 500 is a preferred value for the review of the application, if it exceeds, not well in excess, still it can be pursued. That is the way the guidance is developed.

So when we look at the Turkey Point obviously it exceeded 500 within 20 miles, so then we projected what should -- you know, so we went a little bit more closely, we're looking at the zero to five miles, zero to ten miles, zero to 20 miles, and we looked at the density, estimated the density, so the density varied from 58 to 518, 718.

So then staff considered and determined 200 above the preferred value is not well in excess, therefore -- and also in the connection they evaluated the sites on the safety, environmental, and other considerations.

In addition, this is only the guidance but the environmental planning and other ones are also being evaluated in other areas and they are updated

every five years, so these all went into the thinking and then the staff considered it is acceptable.

CHAIRMAN SVINICKI: Okay.

MR. TAMMARA: That is the basis for it.

CHAIRMAN SVINICKI: Okay. Thank you very much for that answer. And now I will turn to Commissioner Baran for any questions he might have and the time he wishes to consume.

COMMISSIONER BARAN: Thanks. I am going to consume more this time. I would like to follow up on Commissioner Burns's questions about the estimates of sea level rise used in the application and the safety evaluation.

If Units 6 and 7 were licensed and constructed they could potentially operate beyond the year 2100 so sea level rise is a relevant issue that could have safety implications.

In 2012 NOAA provided sea level rise scenarios for the National Climate Assessment, which is, of course, the federal government's authoritative report on the state of climate science compared every four years.

NOAA explained that in recent decades the dominant contributors to global sea level rise have been ocean warming and expansion and ice sheet loss.

NOAA described four global sea level rise scenarios, lowest, intermediate low, intermediate high, and highest.

In the highest scenario the global sea level rose an average of 6.6 feet by 2100. In the lowest scenario the mean sea level rise was eight inches by 2100.

NOAA stated that there was a better than 90 percent chance that global mean sea level rise would ultimately be bounded by these two scenarios, the lowest and highest scenario.

The lowest scenario, as was referred to I think a little bit earlier, is based on a linear extrapolation of the historical sea level rise rate derived from tide gauge records beginning in 1900.

NOAA explained that the intermediate low and the lowest scenario, so the two lowest scenarios, are "optimistic scenarios for future environmental change."

According to NOAA the highest scenario should be considered in situations where there is little tolerance for risk, for example new infrastructure with a long anticipated life cycle, such as a power plant, and the lowest scenario should be considered where there is a great tolerance for

risk.

As Joe mentioned earlier in January this year, 2017, NOAA updated sea level rise scenarios and increased the lowest scenario to one foot of sea level rise by 2100.

So to put this in context, this one foot sea level rise by 2100 reflects the low end of the range of sea level rise outcomes expected under the most optimistic carbon emission scenario in which net emissions drop to zero later this century.

For the purposes of calculating the design basis flood level FPL, as we have talked about, uses an estimated sea level rise of one foot and according to NOAA, again, one foot is what you would expect under the lowest, most optimistic scenario.

So I want to ask the staff given the state of the science why is a one foot assumption adequate?

MR. GIACINTO: Well sea level rise is a global phenomena and staff is confident that the Applicant's analysis is very conservative with an adequate safety margin.

When you look at -- Global sea level rise has implications in site-specific terms, but for the Applicant's analysis there is so many layers of conservatism built into the storm surge.

We are, like I say we are at the boundaries of physics on how big a hurricane can get in terms of the Atlantic Ocean. And, also, I'd like to point out in the NOAA report these sea level rise scenarios are not going to, are not anticipated to diverge until after 2050.

So until that time they are going to track closely and what happens at 2050, you know, we'll see, but, again, sea level is an evolving science. The high estimates are based on the different scenarios for emissions and temperature and things like that and there is different models for those.

In terms of the 2012 report that has been superseded by the, obviously, the 2017 report, so I think the 2017 report uses that evolving science along the way to get a better estimate on sea level rise ranges, because they are ranges, they're not values.

COMMISSIONER BARAN: In my reading of the 2017 report is that I guess you would characterize it overall as more pessimistic than the 2012 report, right, because the lowest scenario went from eight inches to a foot and some of the other scenarios kind of expanded a bit as well.

MR. GIACINTO: It's difficult to project sea level rise because it is noticeable on decadal

scales, so you really have to look at the measurements in terms of decades and you also have to look at, you know, obviously, the objective of the sea level rise studies and the science behind those predictions as well, so it's variable.

COMMISSIONER BARAN: And so when I look at Slide 7 of the staff's slides which has the storm surge components, I thought this was really useful, what I am trying to figure out, at least initially, so one element, the second from the bottom, the yellow element, is future sea level rise and that's a foot.

And as you mentioned there are a couple other areas here where there are conservatisms built in. I think in the response to pre-hearing questions FPL mentioned a couple of them, which is like a 10 percent at around the high tide, which is at the bottom there, the green.

I guess that yielded 1.2 feet of margin. They mentioned I think this design plant grade at the top, which is another 1.2 feet of margin. You have mentioned the middle, the hurricane storm surge and the maximum probably hurricane there.

With respect, and understand this is just one component, if we look at the future sea level rise component of one foot that isn't conservative though,

right? One foot isn't conservative if it is the low end of the lowest scenario that NOAA has that one element is not conservative I would say.

MR. GIACINTO: Well the value of using local tide gauges for sea level rise projections are that inherent in the measurements are local variations, such as vertical land movement.

We have sediments accumulating on the ocean floor creating mass loading which would depress, you know, the tide gauge because it is attached to the ground, or you can have erosion of land surfaces which would cause uplift and you also capture the localized variations in the ocean currents.

So the local tide gauges from the staff's conversations with subject matter experts on sea level rise is the best thing to use at the current time for sea level projections.

COMMISSIONER BARAN: Okay. In August of this year the Pacific Northwest National Laboratory prepared a study for NRC on the potential impacts of climate change on the southeastern United States.

It reported something that relates to one of the questions Commissioner Burns had which is that the rate of global mean sea level rise almost doubled between 1993 and 2007 compared to the average over the

20th century.

According to PNNL with continued ocean thermal expansion and potentially more rapid melting of glaciers and ice sheets in the future the relative sea level along the southeastern U.S. coast is projected to rise by three to six feet by 2100 under an interagency intermediate one meter global mean sea level rise scenario.

So if three to six feet relative sea level rise across the southeastern U.S. coast comes from the one meter or three feet global mean sea level rise and that reflects that the relative sea level rise projections of the east coast, including the Atlantic close to Florida, are higher than the global mean in every scenario.

FPL mentioned in their pre-hearing question responses these other conservatisms and they added up to a margin of a total of 3.4 feet. Did the staff analyze the impacts of a three to six foot sea level rise on this site?

MR. GIACINTO: No, the staff did not analyze a three to six foot sea level rise. The Applicant's analysis was very conservative with the appropriate safety margin and it included sea level rise and it was actually within the range of likely

estimates for 2017 from the NOAA climate report.

And, again, you know, with a storm surge of over nine feet above and 40 percent greater than the historical storm surge of record staff feels it is sufficiently conservative to account for variations in sea level rise and also current estimates of likely sea level rise.

COMMISSIONER BARAN: Let me ask FPL the same question. You know, you have talked about the complete margin of 3.4 feet, although that doesn't include the probably maximum hurricane conservatism, did you analyze the impacts of a sea level rise beyond a 3.4 feet, such as six feet?

MR. FRANZONE: No. No, not as a specific example in the, you know, FSAR. However, you know, when you do look at it we look at the margin --

COMMISSIONER BARAN: Right.

MR. FRANZONE: -- and we knew that we had a significant margin. And then even so, it's a phenomena that doesn't occur overnight and so we have time to observe it and we can, and the existing regulatory regime and our corrective action program easily allows us to evaluate if it, if say the scenario of the one foot assumption that somehow becomes invalid or is shown to be not conservative,

and we would enter that into our corrective action program and then take appropriate action at the time.

COMMISSIONER BARAN: In its 2017 report, the latest NOAA report, it explained "the projection results presented in several peer review publications provide evidence to support a physically plausible global mean sea level rise in the range two meters to 2.7 meters," or six to eight feet, "and recent results regarding Antarctic ice sheet instability indicate that such outcomes may be more likely than previously thought."

So according to the climate experts at NOAA and working with NOAA a 6-foot sea level rise by 2100 is a real possibility. I guess the question I have in terms of this response of, well, if it's a slow moving phenomena there is a lot of time, doesn't it make sense to prepare for that possibility now at the licensing stage?

I mean here we are, we're talking about potentially licensing a piece of infrastructure that could be there past 2100 shouldn't we factor this in now to our analysis rather than wait and see how things pan out in 40 or 50 years?

MR. GIACINTO: Well sea level rise, of course, is recognized over decadal scales from, for

example, the 1993 to 2007 estimate of doubling, that might be in that period but that doesn't mean it's going to double again.

It's a decadal pattern that you have to look at. In some cases sea level rise can go up and down. That's why we need to look at the decadal scales, on a decadal scale.

So it's a variable, it's an evolving science. Some of these estimates of ice sheet melts are highly variable. There is a lot of factors that goes into the estimate of sea level rise ranges and a lot of variables that go into that and that's why we're getting so many different ranges.

We have a thermal expansion of the ocean. The ocean basin itself could change volume, you could have uplift, it's a matter of the changing volumes and the concentration scenarios that are presented, the four that you mentioned.

So it is an evolving science. There are potential, it potentially could rise that high, but at this point in time we're not see it. It's a global phenomena so it probably would be more applicable as an operating fleet, maybe a generic communication to a generic issue, as a safety significant issue, or perhaps another avenue would be a 50.54(f) letter

requesting information and direction for the licensees.

COMMISSIONER BARAN: What I am hearing from both FPL and the staff -- and if Mr. Franzone wants to jump in with something else, please do -- it sounds like when we look at these multiple components of storm surge the staff's view and FPL's view is there actually is a lot of conservatism built into that, there is a lot of margin.

It may not be reflected on this one element, but it sounds like what I am hearing is, well, even if one of these higher scenarios ended up coming to pass on sea level rise and we had, intermediate is actually three to six feet, but if we had six feet or eight feet by 2100 that there would still be enough conservatism coming from maximum probable hurricane and other things to make you feel comfortable today at the licensing stage, is that where you are at?

MR. FRANZONE: Yes, and I want to add one more thing, is that we actually looked at newer data as the result of an RAI from the NRC and we found that the actual, using the same linear trend over the next hundred years we actually ended up with like 0.69 feet, 0.70 feet using the Key West station, so it was

actually less of a sea raise.

Now that data went from I believe 1941 to 2010 and so we covered that period. So I mean when, you know, for us as applicants we need to use the data. I mean that's really the best source of information for us and based on that we used, we project it, and so --

COMMISSIONER BARAN: And it sounds like from Ellen's presentation the increase in rate, the rate of increase that PNNL was reporting between 1993 and 2007 being double the rate of increase between 1900 and 1993, that's not really being reflected in the gauge closest to Turkey Point, you're not seeing that there.

MS. SMITH: The gauge closest to Turkey Point was the one at Miami Beach --

(Simultaneous speaking)

COMMISSIONER BARAN: Right, yes it stopped --

MS. SMITH: -- and it's not operated most recently. The experts in interpreting these data point out that data for a very short period can give extremely misleading results because of the multiple factors that affect sea level rise at any location or globally.

It's things like El Nino oscillation, La Nina, a similar oscillation in the Atlantic related to tides and large scale circulation. There is also a 19-year cycle of the sun and the moon and all these things come together.

So for a short period, and you can be shown with historical sea level data that for short periods you can find very anomalous results that don't match the long return trends.

COMMISSIONER BARAN: So their view -- I should wrap this up, I think. So their view is that basically it's actually, you're going to get better projections going all the way from 1900 to present than to take the most recent period where you saw an increase in the rate of sea level rise?

MS. SMITH: It may or may not be better, but it's more consistent. It's difficult to discern a real trend with a very short time period and very short, 20 years is very short in this context.

COMMISSIONER BARAN: All right. Thank you very much.

CHAIRMAN SVINICKI: All right. Well I thank the panelists again for this, our Safety Panel. We will now break for lunch and we will reconvene at 1:30 p.m. So we are adjourned until 1:30 p.m. Thank

you.

(Whereupon, the above-entitled matter went off the record at 11:54 a.m. and resumed at 1:33 p.m.)

CHAIRMAN SVINICKI: Well, good afternoon, everyone. I call the hearing to order once again. So now we will hear from the environmental panel.

The parties will address the environmental review performed in connection with the combined license application, including relevant sections of the final environmental impact statement related to the following novel issues: cooling water sources, alternative sites, critical habitat, and consultations with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service under the auspices of the Endangered Species Act.

I remind all of the witnesses that they remain under oath, and that the Commission is familiar with their prehearing filings. I would ask the panelists to please introduce themselves, and again, for this combined panel, we will begin with the FPL witnesses, so please introduce yourselves and then proceed with your portion of the environmental panel presentations.

MR. MAHER: Good afternoon, Commissioners. My name is Bill Maher with Florida Power and Light.

MR. JACOBS: Paul Jacobs, Florida Power and Light -

MR. ORTHEN: Richard Orthen.

(Simultaneous speaking)

MR. JACOBS: - engineer.

MR. ORTHEN: Richard Orthen, Florida Power and Light, licensing engineer.

MR. MAHER: We'll start with the presentation, slide two, please. As Mr. Franzone has mentioned earlier, Florida Power and Light has over 50 years of environmental stewardship coupled with power generation at the Turkey Point site.

Turkey Point 6 and 7 utilizes an existing industrial facility next to an existing nuclear power plant using approximately 80 percent of the existing transmission corridors for a new nuclear power plant.

The construction roadway network that we are building in order to provide construction worker access to the site is being proposed to be removed after construction is completed in order to preserve the environment around the Turkey Point site.

In addition, as you have heard previously, Turkey Point is creating water reuse opportunity for both Miami-Dade county and for - with minimizing the environmental impact associated with that. So what

I'd like to do is turn it over to Mr. Paul Jacobs, and he'll continue with the presentation.

MR. JACOBS: Thank you. Good afternoon. During the early phase of the planning for Turkey Points Units 6 and 7, FP&L performed a detailed study to determine the optimal method of supplying cooling water makeup to the units.

A total of 14 potential water sources were identified. The study concluded that reclaimed water was the best alternative that was technically feasible, could be permitted, and was environmentally preferable. Slide three, please?

Miami-Dade and FPL worked together to develop a joint participation agreement for supplying reclaimed water to Units 6 and 7. Under this plan, Miami-Dade's South District Wastewater Treatment Plant would provide up to 90 million gallons a day to FPL for plant cooling water, makeup, and other plant uses.

The use of reclaimed water is beneficial to the county to help it meet its reuse requirement, and for FPL to have an adequate and reliable water supply with no impacts to surface water.

FPL will also construct a reclaimed water treatment facility on site to further treat the reclaimed water to optimize the water quality for

efficient plant operation. The figure displays the nine-mile route the reclaimed water pipeline will take from the South District Treatment Plant to the Turkey Point site. Slide four, please?

This figure is a schematic of a typical radial collector well installation. The radial collector well supply system will be available to the plant in the event that reclaimed water from the South District Plant is not available in sufficient quantity and quality.

As was pictured in the overview portion of the presentation, the radial collector well system caisson and pumping system will be located on the Turkey Point peninsula in an upland area and can be constructed without disturbance to Biscayne Bay.

Pictured on the left is a concrete caisson approximately 50 feet in diameter and 50 feet in depth. The figure shows one lateral, but each of the four installed caissons will have a number of laterals that extend radially outward under the bay.

The laterals shown as extending from the caisson will be drilled at a depth of between 30 and 45 feet below the bay bottom where construction will not cause disturbance to the bay.

I'd like to turn this over to Mr. Orthen

who will now discuss the FPL augmented site selection process.

MR. ORTHEN: Yes, thank you, Paul. Slide five, please? Good afternoon. In our process for considering alternative sites, we used the NRC's environmental standard review and regulatory guidance, as well as the EPRI siting guide.

Our region of interest in this process was a geographic area we looked in to find potential and candidate sites for the project, that is the FPL service territory and areas closely adjacent to it.

This region was studied, or as I say, screened, using exclusionary avoidance criteria to eliminate areas that were unsuitable or significantly less suitable than other potential siting areas. Using this screening process, we found 16 candidate areas that we could use to identify potential sites to host the project.

FPL was able to identify 21 potential sites for the reactors in these candidate areas using mostly our corporate knowledge of the areas as well as a more detailed canvassing effort to pinpoint potential greenfield potential sites. This is why we call it an augmented analysis.

Carrying this selection process through to

the next step, we looked at the slate of 21 potential sites, screened each one to identify primary sites, and from that group, found the most suitable candidate sites. Slide six, please?

From the 21 potential sites, we found eight primary sites in the first screening cut, and five of those eight sites made it through to the second group as our group of final candidate sites.

We based our second cut screening on fundamental site suitability criteria such as required infrastructure, including transportation, railroad, road, and barge access, as well as any civil work necessary for site development.

Next, we went onto the final step in the selection process, comparing each of the five candidate sites on various issues and attributes, as well as factoring in the cost and environmental tradeoffs needed to develop each site.

At last, we arrived at the point where we could rank those candidate sites. Based on this ranking, we concluded there were no sites that were environmentally preferable to our proposed site down at Turkey Point. Slide seven, please?

Now I will to turn to talk about the Turkey Point site critical habitat for the American

crocodile, most notably the important work FPL carries out to improve wildlife sustainability there.

Crocodiles were first observed at the Turkey Point site in 1976, with active nesting observed two years later. At the time, the crocodiles had a very small population, but they have thrived in the cooling canals in the Turkey Point industrial wastewater facility.

The cooling canals are vital to the crocodiles' success because they contain an extensive system of canals and berms, and they support a variety of wildlife that are tolerant of the subtropical salient environment found there.

Critical habitat for the American crocodile has been established in south Florida and a small portion, less than one percent, exists at Turkey Point, mostly in the cooling canals, but also including the 218 acres of partially disturbed mud flats that is the site for Units 6 and 7.

FPL proudly manages these areas through its crocodile management program that features habitat enhancement on the banks of the cooling canals to improve the opportunities for nesting, active management of water to improve quality, and foraging opportunities, and monitoring reproductive success.

These habitat management efforts, as well as other efforts in the larger critical habitat beyond Turkey Point, have been so effective that in 2007, the U.S. Fish and Wildlife Service was able to down list the crocodile species from federally endangered to threatened.

Now, regarding our consultation with the agencies, FPL began informal consultation with them in September 2007 when we formed our compatibility working group which included federal, state, and local regulatory agencies that we invited to offer their views on the ways the project could complement or enhance their goals and objectives for the areas affected by the project.

The Fish and Wildlife Service was an active participant in this process which met eight times between 2007 and 2009. FPL continued this collaboration by working closely with Fish and Wildlife Service staff throughout the project to examine potential impacts to listed species, methods for avoiding impacts, conservation measures to reduce impacts, and unavoidable impacts mitigation.

In its 2017 biological opinion of the project, the U.S. Fish and Wildlife Service concluded that disturbance from the project due to activities at

the Units 6 and 7 sites may affect, but would not adversely affect the six ESA listed species. Please note the slide seven count should read six, not five. They further determined that the level anticipated take of these species would not likely jeopardize them.

The service described the crocodile habitat within the proposed Units 6 and 7 site as relatively poor quality. This can be attributed mainly to the fact that this area is dry during certain times of the year. Moreover, vegetation and aquatic prey species for the crocodile do not occur there, and observations by FPL indicate that it's not a place the crocs like to be in for any length of time.

Slide eight, please? With this view of our project setting, that will end my presentation. Thank you.

CHAIRMAN SVINICKI: I thank the applicant panelists for that presentation. I would now as the NRC staff panelists to please come and sit behind your name tents, and please introduce yourself and then proceed with the staff's presentations. Thank you.

MS. WILLIAMSON: Good afternoon. My name is Alicia Williamson and I'm the environmental project

manager for this project.

MR. HAQUE: Good afternoon. I'm Mohammed Haque, senior hydrologist with the NRO.

MR. KUGLER: My name is Andrew Kugler and I'm a senior project manager in the Office of New Reactors.

MR. DOUB: Good afternoon. I'm Peyton Doub, ecologist and wetland scientist with the Office of New Reactors.

MS. WILLIAMSON: Hello, my name is Alicia Williamson, and I'm the environmental project manager for the Turkey Point Units 6 and 7 environmental review. Today, the staff will be presenting information on three environmental topics. The first will be by NRC hydrologist, Mr. Mohammad Haque, who will talk about the proposed cooling water sources.

Next, we will have Mr. Andrew Kugler, NRC senior project manager, speak about the alternative sites review. Finally, we will close the environmental staff presentations with NRC ecologist, Mr. J. Peyton Doub, who will present the staff's findings regarding critical habitat for the threatened American crocodile and the Endangered Species Act consultation. Next slide, please?

MR. HAQUE: Thanks, Alicia. My name is

Mohammad Haque. I'm a senior hydrologist in the Office of New Reactors. I will be presenting information on the cooling water sources for the proposed Turkey Point Units 6 and 7.

The primary source of cooling water for the circulating water system will be reclaimed water, which is unique because only one other nuclear plant in the United States, the Palo Verde Nuclear Generating Station, uses reclaimed water for cooling.

The reclaimed water will be obtained from the Miami-Dade water and sewer department's South District Wastewater Treatment Plant, hereafter called the South District Plant.

Additionally, FPL includes in the design a backup water source for added power generation reliability in case the reclaimed water cannot meet the plant's needs for a period. The addition of this backup water source is unique to the proposed Turkey Point Units 6 and 7 because no other U.S. nuclear plant has a backup water source.

The proposed backup source of cooling water for the circulating water system for Turkey Point Units 6 and 7 would be saltwater obtained from beneath Biscayne Bay through four radial collector wells. The pumping period and amount of water

withdrawn from the wells would be limited by the Florida Department of Environmental Protection's Conditions of Certification to 60 days or less per year.

The circulating water system would be designed to utilize 100 percent of its required water supply from reclaimed water, saltwater, or a combination of the two sources. Next slide, please?

This slide presents a simplified illustration of the two proposed cooling water sources for the proposed Turkey Point Units 6 and 7 and disposal of the plant's effluent water. About 73 million gallons per day of reclaimed water would be obtained from the South District Plant located about nine miles north of the Turkey Point site.

The water would be piped to FPL's reclaimed water treatment facility for further treatment. The treated reclaimed water would be stored in a makeup water reservoir from which water would be withdrawn as needed to provide cooling water to the cooling tower basins for each unit.

The backup source of cooling water is saltwater extracted from beneath Biscayne Bay to four radial collector wells. Each radial collector well would contain several lateral collector lines at

depths of 25 to 40 feet beneath the bay floor, extending out horizontally up to 900 feet. When used, the saltwater from radial wells would be pumped directly to the cooling tower basins as needed to provide cooling water.

The disposal of the effluent would be done by injection into the border zone of the lower Florida aquifer under the Florida Department of Environmental Protection's underground injection control program. The border zone is a deep-set aquifer over 3,000 feet below the surface at the site.

Water within the border zone is kept separate from the overlying brackish upper Florida aquifer by around 1,500 feet of low permeability zone. The low permeability zone is referred to as the middle confining unit of the Florida aquifer system. Next slide, please?

This slide shows a planned view of a typical radial collector well system as presented in figure 3-5 of the EIS. As shown in this diagram, each radial collector well would have several lateral collector lines extending horizontally beneath the Biscayne Bay. Next slide, please?

In the EIS, the review team's evaluation considered how surface water and groundwater resources

would be affected during the construction and operation of Turkey Point Units 6 and 7. The staff concluded that the impacts to surface and groundwater use and quality would be small during construction and operation. Because no surface water or groundwater is being withdrawn to be used as the primary water source for cooling, there is no impact on surface water or groundwater users.

The staff also concluded that impacts to surface and groundwater use and quality would be small during construction and operation when the backup source saltwater from the radial collector wells is used. This conclusion, as discussed in detail in the EIS, was based on part on the limited use of the radial wells.

The conclusion was also based on the understanding that only a small portion of water would come from the Biscayne aquifer, which staff determined based on effects on certain hydrological features as projected by FPL's modeling effort, a NRC-sponsored USGS modeling study, and an additional modeling analysis confirming the review team's understanding.

A detailed description of this analysis, including the modeling efforts, is provided in the EIS in sections 2.3, 4.2, 5.2, and appendix G.2.3. This

concludes my remarks. I will now turn the presentation over to Mr. Andy Kugler.

MR. KUGLER: Thank you, Mohammed. The consideration of alternative sites is a fundamental part of the staff's review of a new reactor application.

When it compares sites, the staff typically uses the same type of cooling water source, such as surface water, at the proposed and alternative sites to avoid a potential bias in the comparison. This is consistent with the guidance in the Environmental Standard Review Plan.

However, the guidance allows for the use of a different type of cooling water source at the alternative sites if the type of source used at the proposed site cannot be used. That is the case for the Turkey Point combined license application.

None of the alternative sites would have had access to an adequate source of reclaimed water, and the staff did not identify other viable sites that could have access to enough reclaimed water. Therefore, the alternative sites would have to get water from some other source. Next slide, please?

The location of the alternative sites and the proposed sites are shown on this slide. The St.

Lucie alternative site is on the east coast while the other three alternative sites are clustered around Lake Okeechobee and its associated rivers. Next slide, please?

For the St. Lucie alternative site, water would come from the Atlantic Ocean through the existing intake for the currently operating units at that site. The situation for the three inland alternative sites, Glades, Okeechobee, and Martin, is more complex because surface water in that region is tightly managed.

FPL had initially proposed the use of surface water to cool the plant at these sites, but based on discussions with the South Florida Water Management District, it became clear that obtaining sufficient surface water to cool the plants was unlikely.

Therefore, FPL modified its approach proposing to use a combination of surface water and groundwater at these alternative sites. FPL proposed to use excess surface water whenever it was available and to store excess surface water in a 3,000 acre reservoir.

When no excess surface water was available and the water in the reservoir had been consumed, the

plant would use groundwater pumped from a deep saline aquifer.

FPL also proposed the use of a desalination plant to reduce the salt content of water being pumped out of the aquifer. This step was proposed to protect nearby vegetation from drift from the cooling towers. Drift refers to water droplets carried out of the cooling tower with the water vapor. Drift carries with it particulates such as salts. Next slide, please?

Because the applicants' proposed approach for the three inland sites was unusual, the staff considered whether a further modification of this approach would lead to reduced environmental impacts. First, the staff looked at whether impacts could be reduced by eliminating the reservoir and relying on groundwater whenever excess surface water was not available.

In addition, it was not clear that the desalination plant was warranted to protect nearby vegetation because the amount of drift escaping from a modern cooling tower and reaching nearby vegetation is already small. As such, the staff did not include a desalination plant in its evaluation.

Therefore, the staff's evaluation of the

impacts of the inland alternative sites was based on cooling the plant with excess surface water whenever it was available and using saline groundwater at other times. Next slide, please?

Using the approach that it had developed, the staff compared the impacts of building and operating the nuclear units at the alternative sites to those at the proposed site. Based on predicted environmental impacts at the proposed site and the alternative sites, the staff concluded that none of the alternative sites was environmentally preferable to the proposed site.

In addition, in the EIS, the staff acknowledged there was uncertainty regarding how the cooling water system at the inland sites could be implemented. No user has ever requested a permit to use water in these quantities from the deep aquifer FPL proposed to use. This would be a first of a kind application.

Because of this uncertainty, the staff qualitatively evaluated how the impacts would be different if the 3,000 acre reservoir was included. Including the reservoir would increase the impacts on terrestrial ecology and land use, and in a minor way, would also increase the impacts on aquatic ecology and

surface water use. Impacts on other resources would likely not change appreciably.

This concludes my remarks. I will now turn the presentation over to Mr. Peyton Doub.

MR. DOUB: Thank you, Andy. Accessing the potential -

PARTICIPANT: I think your mic is off.

MR. DOUB: Accessing the potential for effects to threatened and endangered species and their habitats is a key component of the staff's environmental review of a new reactor application. Under the Endangered Species Act, habitats may be designated as critical, meaning they are essential to support species protected under the act.

The designation of critical habitat does not necessarily restrict development, but does require proponents of development in designated areas to examine the protection of important characteristics of the habitat.

The Turkey Point application is novel since it proposes to build new reactors in an area designated as critical habitat, in this case for the threatened American crocodile. No other COL application to date has involved building new facilities in areas designated under the Endangered

Species Act as critical habitat.

On June 23, 2017, the U.S. Fish and Wildlife Service issued a biological opinion that among other considerations concurred with the staff's conclusions that construction and operation will not adversely affect designated critical habitat for the American crocodile. Next slide, please?

The entire proposed Turkey Point Units 6 and 7 plant area and most of the nearby industrial waste facility are situated within designated critical habitat for the American crocodile. Potential impacts to critical habitat include the permanent loss of approximately 270 acres to accommodate the proposed new reactors and associated infrastructure.

Additionally, approximately 211 acres of additional critical habitat would be affected by relocation of the soils and other solid material to three disposal areas on upland berms of the industrial waste facility.

The review team's analysis concluded that the affected area constitutes only about 0.09 percent of the total terrestrial crocodile critical habitat available were only about 270 out of 293,000 acres in south Florida as depicted on this map.

Past monitoring and nesting surveys

conducted by FPL suggests that the proposed plant area in the northeast portion of the industrial waste facility is generally considered to be low quality crocodile habitat that is not actively used by crocodiles.

The applicants specifically selected the three proposed muck storage areas in the industrial waste facility because of their lack of suitable nesting substrate for crocodiles and because they represent only a very small percentage of berm habitat available for crocodiles in the industrial waste facility.

Higher quality foraging and nesting habitat occur south and west of the affected areas. The Fish and Wildlife Service considers nesting and foraging qualities to be important features for critical crocodile habitat.

Because the designated critical habitat in the power block and muck storage areas is considered to be poor quality for nesting and foraging for the crocodile, the Service in their biological opinion agreed with the staff's conclusions that although there may be adverse effects to the American crocodile, there would be an overall minimal impact to the species. Next slide, please?

The applicant already implements ongoing active crocodile monitoring and work restrictions on the site as part of compliance with an existing biological opinion for Turkey Point Units 3 and 4. These measures include speed limits and other protective measures related to vehicular incidents, habitat management, nesting surveys, and crocodile relocation.

These existing measures would be complemented by additional measures established as terms and conditions in the new biological opinion specifically issued by the Fish and Wildlife Service for Units 6 and 7.

As stated in the biological opinion, FPL would implement several protective measures for the crocodile including education of construction workers regarding crocodile habitats, behaviors, and reporting any contact with nests or individuals, installation of exclusion fencing to prevent migration to the power block area from the northern portion of the industrial waste facility, and daily pedestrian surveys immediately prior to and during land clearing and fill placement within the power block area, and during much hauling along associated roadways. Other measures outlined in the biological opinion such as enhancing

other nearby wetland habitat may also indirectly benefit the crocodile.

The Fish and Wildlife Service concluded that the proposed project can be expected to result in the incidental take of crocodiles in the form of harm from habitat loss and possible injuries or mortalities from vehicle collisions.

Based on the increase in road traffic during construction and the use of fencing to minimize risk to crocodiles at road crossings, the Service estimated incidental injury and mortality along roads to be one crocodile every five years or a total of two crocodiles over the duration of the estimated ten-year construction phase. During operation, the Service estimated injury and mortality along the roadways to be one crocodile every ten years over the operational life of the project.

Therefore, although Turkey Point Units 6 and 7 would be constructed on designated critical habitat, the Fish and Wildlife Service confirmed that the construction and operation of the new units would not jeopardize the survival of the American crocodile population, nor would the project result in adverse modification of designated critical habitat to the extent that it detrimentally affects the overall

crocodile population. Next slide, please?

The American crocodile is but one of several threatened or endangered species that the staff considered in its environmental review for Turkey Point Units 6 and 7.

The staff prepared and submitted separate biological assessments to the U.S. Fish and Wildlife Service and the National Marine Fisheries Service addressing potential effects of the project on threatened and endangered mammals, birds, reptiles, fish, insects, and plants knowing to occur or potentially occur in the affected area.

The National Marine Fisheries Service concurred with the staff that the project would have no effect, or may affect, but was not likely to adversely affect the marine and anadromous fish, sea turtles, and marine mammals under its purview.

The Fish and Wildlife Service determined in its biological opinion that the project may adversely affect the American crocodile, eastern indigo snake, everglade snail kite, Florida panther, rufa red knot, and wood stork.

The Fish and Wildlife Service issued NRC an incidental take statement establishing incidental take limits for each of these six species measured in

numbers of individuals affected and/or areas of habitat disturbed. To comply with the terms and conditions of the biological opinion, the applicant must implement specific protective and conservation measures.

The draft environmental protection plan prepared by the staff incorporates many of these terms and conditions, and the U.S. Army Corps of Engineers has agreed to incorporate the remainder as conditions to a future Department of the Army permit for the project. Now I return you to Alicia Williamson.

MS. WILLIAMSON: Thank you, Peyton. The staff thanks the Commission for this opportunity to present and it's ready to take any questions. Thank you.

CHAIRMAN SVINICKI: Thank you for those presentations, and similar to the safety panel, I would ask that given that you have the other witnesses sitting behind you, if you would move slightly off to the sides, that would be appreciated. Thank you. And so for the questioning of this environmental panel, I will lead off today.

So for the applicant, let me begin. Regarding the reliance on the reclaimed water system which has been described, I think, by both the

applicant witnesses and the staff, I imagine that that process required FPL to engage with local and state regulatory agencies.

Could you please describe at a high level the engagement that you had with these other authorities regarding siting and construction of the on-site treatment facility and the system that connects the existing wastewater treatment plant with those on-site facilities? And what are the principal interest areas of those local and state authorities with which you needed to engage?

MR. MAHER: Yes, Commissioner, this is Bill Maher. We engaged with Miami-Dade County early on in the project as you have heard, and we have come up with a joint participation agreement which outlines at a very high level the water attributes that we would be looking for once we were to build Turkey Point Units 6 and 7.

With respect to the location of the reclaimed water treatment facility, as you heard, we had relocated that as a result of some county interactions in order to minimize environmental impacts, so that illustrates some of the engagement that we had with the county and city officials.

CHAIRMAN SVINICKI: Okay, thank you. And

for the staff, typically I ask this type of question, and I know that there's a description in the record of the process that the staff used for identifying and evaluating potential new and significant information for the environmental analysis, but could one of the NRC staff panelists just give a description of how you went about doing that, of identifying and then evaluating any potential new and significant information given the long pendency of the staff's review?

MS. WILLIAMSON: For this particular application, we did utilize the staff's guidance. We were on the lookout for new and significant information. Although we did not formally initiate that process, I think it calls for sending the applicant a letter and telling them to keep us apprised of information because of the -

We always thought that the hearing was imminent or impending, so we never officially sent that letter, but did keep apprised of that particular process by talking with, a continuing dialogue with our other federal partners and state partners throughout the various times after the EIS was published.

Additionally, there's a strong level of

public interest for this particular project, so we did receive some calls or emails from members of the public as well, but mainly through our dialogue with our various federal, state, and local partners.

CHAIRMAN SVINICKI: As a result of that process, was there any information that met the staff's threshold for being new and also significant, and in any way modifying the staff's previous environmental conclusions?

MS. WILLIAMSON: No, there was nothing that met the new and significant criteria.

CHAIRMAN SVINICKI: Okay, thank you. With that, I will recognize Commissioner Baran.

COMMISSIONER BARAN: Thanks. I'd like to begin by asking about the site selection process that led to selecting the Turkey Point site as the location for the proposed units. I'll start with some questions for FPL.

If I understand it from the final EIS and from your presentation on this panel, the site selection process identified 21 potential sites. FPL then applied the screening criteria and identified the top eight ranked sites which did not include Turkey Point.

However, because it was an existing

nuclear power plant site, Turkey Point was included on an expanded list of ten potential sites that remained in consideration along with the St. Lucie site. Is that right?

MR. ORTHEN: That's correct.

COMMISSIONER BARAN: And when these ten remaining sites entered the next phase of the selection process, FPL used 34 weighted criteria to evaluate them, and based on that evaluation, Turkey Point emerged as the number one preferred site. Is that right?

MR. ORTHEN: That was part of the import of that process, yes, but it was ranked highest in the technical evaluation and it graded more favorably in eight of ten, 12 considerations of risk and strategic measures.

COMMISSIONER BARAN: Okay, and I see on your slide five, it walked through this -

MR. ORTHEN: Right.

COMMISSIONER BARAN: - a little bit on slide six. Can you walk us through how did Turkey Point end up finishing first in the second phase after failing to make the top eight in the first phase? What was driving that outcome?

MR. ORTHEN: I'd like to ask Kyle Turner

if he could please speak to that.

MR. TURNER: Sure.

CHAIRMAN SVINICKI: And as you approach the podium, if you could please again identify yourself, your title or organizational affiliation, and confirm that you've been sworn as a witness?

MR. TURNER: My name is Kyle Turner. I'm a principal with McCallum-Turner, Incorporated. We were a contractor to FPL, and I have not been sworn in.

CHAIRMAN SVINICKI: Oh, okay, well, then I will ask our general counsel here to, okay. You have identified yourself, so I would ask that you raise your right hand and I will read the oath. Do you swear or affirm that the testimony you will provide in this proceeding is the truth, the whole truth, and nothing but the truth?

MR. TURNER: I do.

CHAIRMAN SVINICKI: Thank you very much. And if there is no objection to this witness, I will let you proceed to provide a response.

MR. TURNER: To expand a little bit on the process, the first down select, I'll call it, from 21 sites to ten was made on the basis of what we call screening criteria. They're derived from those in the

EPRI siting guide, and they're very generalized.

They're intended to give us a very quick and dirty picture of the relative suitability of all of the sites then under consideration. The purpose of that is to arrive at a smaller number of sites that we can then spend a larger set of resources in examining in more detail.

Those criteria are - the set of criteria that we call screening criteria are typically organized and crafted in order to examine greenfield sites. They don't really have in them anything that allows you to reflect the goodness or badness of an existing site.

So the fact that in the second phase where we used a much more detailed set of 34 criteria, that Turkey Point rose much higher in the ranking, is neither really should be surprising, nor is it unique. There have been other site selection studies we've done where a similar thing happened in regards to an existing plant site.

COMMISSIONER BARAN: And were there - when I look at the slide six and it has the scores there of the ten and Turkey Point is the highest by a fair bit, were there any particular factors you could point to there as driving the relative high score of Turkey

Point?

MR. TURNER: Well, I can answer that very generally, but those scores are very much a composite of a weighting and rating scheme, and it's very difficult to draw out of that a central theme.

COMMISSIONER BARAN: Okay.

MR. TURNER: Because Turkey Point, as other sites, would rate better or worse than others depending on what criterion one might be examining, so the result there truly is a composite one, and the aggregate Turkey Point came out better for multiple reasons.

If I had to, off the cuff now, give you a suspicion of what probably drove that, it would be that it's an existing site. It had very good ratings in regards to new disturbance, in regards to proximity to existing infrastructure and those kinds of things.

COMMISSIONER BARAN: Okay, thanks. That's helpful. Let me ask the NRC staff. In response to prehearing questions, the staff acknowledged that the Turkey Point site was handled differently than the alternative sites, but stated that NRC guidance provides for this because it's an existing nuclear power plant site.

Is the guidance in the standard review

plan how the Turkey Point site made it through the first round of the site selection process? Does it automatically get through the first round because it's an existing power plant site?

MR. KUGLER: I believe the way the applicant wrote their environment report, that they did include both Turkey Point and St. Lucie as existing sites because of the exception that's discussed in the environmental standard review plan for an existing site.

COMMISSIONER BARAN: So that's what gets them through phase one?

MR. KUGLER: Yes, it would get them through phase one essentially regardless of their rating. Really that exception is intended by the staff to just be for the proposed site. In other words, the way the process is set up, an applicant can just choose a site.

Just pick it, put it aside, then go through a process to identify and evaluate alternative sites, come down a group of alternatives, and then compare each alternative site to the proposed site and determine if they are environmentally preferable.

It wasn't really intended to necessarily include all nuclear sites within the region. That was

the approach that FPL took. It did not harm the process because they still had a good set of alternative sites for us to do the comparison.

COMMISSIONER BARAN: The site selection guidance establishes exclusionary criteria to be applied at the beginning of the site selection process. To be a candidate site, a site has to meet these minimum criteria. If a site can't meet all of the criteria, that would preclude siting a nuclear power plant at that location.

Some of the exclusionary criteria relate to national parks, critical habitat for endangered or threatened species, and population density. Was the Turkey Point site required to meet the exclusionary criteria?

MR. KUGLER: It would not be because it was chosen through the exception. So basically you take and you set it aside so it doesn't go through that process.

COMMISSIONER BARAN: Okay, so that's part of that phase one it moves past -

MR. KUGLER: Correct.

COMMISSIONER BARAN: - because it's an existing site?

MR. KUGLER: Correct.

COMMISSIONER BARAN: If Turkey Point wasn't an existing nuclear power plant site and the exclusionary criteria were applied to the site, would the exclusionary criteria have been met?

MR. KUGLER: Well, this is a hypothetical, but I don't believe it would have based on the critical habitat at least because there is critical habitat on the site. Population density, I'm not sure if it would have. It is over 500 at this point, so I think it -

COMMISSIONER BARAN: I think the exclusionary criteria actually had the population density cut off at 300 -

MR. KUGLER: 300?

COMMISSIONER BARAN: - per square mile with a 20-mile radius, and the actual amount was 656. I don't know if FPL wants to chime in on this. If Turkey Point wasn't an existing nuclear power plant site and the exclusionary criteria were applied to the site, would the criteria have been met?

MR. ORTHEN: I would have to take that back and think about it at this point. I really have not considered that fully.

COMMISSIONER BARAN: For anything that wasn't an existing site, if you exceeded - if you did

have portions of the site that lied within mapped American crocodile critical habitat or you exceeded the population density by a factor of two, would that have eliminated such a site from consideration for a nonexisting power plant site?

MR. KUGLER: Well, again, this portion of the process is actually run by the applicant. It would probably make more sense if they responded to that portion.

COMMISSIONER BARAN: I have a thought on that.

MR. ORTHEN: Could you repeat that?

COMMISSIONER BARAN: Well, what I'm trying to understand is in part if we were talking about a site that was not an existing power plant site, and it lied within mapped critical habitat, and it more than doubled the population density cutoff, that 20-mile radius, would any site that wasn't an existing power plant site, would they have been excluded, eliminated based on those criteria?

MR. ORTHEN: It would be a possibility, yes, but again, I'd have to defer to Kyle for that.

MR. MAHER: Yes, this is Bill Maher. So if you look at - if Turkey Point was not a nuclear site, if you look at siting a power plant down there,

Florida, as you know, is a peninsula, and the majority of the population zones at least are situated around the coast.

On the inland sites, as Mr. Kugler has already informed you, there are water restrictions, both ground and surface water restrictions, also inland sites are mostly agricultural in nature. Within Florida, as we wrote for our purpose and need on this particular project, it was to serve baseline - or provide base load generation for the Miami load center.

And if you look at where Turkey Point is in relation to that Miami load center, it provides a balance around that load center. So if it was not a nuclear power site, you would have to go through that weighting criteria that Kyle had talked about previously to see, given those changed circumstances, if you would still be able to provide a balanced load around that load center for a new plant.

COMMISSIONER BARAN: Okay, the National Park Service was a cooperating agency on the Turkey Point final EIS. The Park Service is involved because the Turkey Point site is immediately adjacent to Biscayne National Park, and Everglades National Park is located seven miles to the west of the facility.

In a December 2016 letter to NRC, the Park Service stated, "NPS continues to have serious concerns regarding the adequacy and accuracy of the final EIS." The Park Service expressed its view that, "This project poses serious direct and cumulative impacts to National Park Service resources."

NPS went on to say, "It does not seem to be in the public interest to expand a power plant adjacent to Biscayne National Park and near Everglades National Park." Did the staff evaluate these concerns, and if so, what did you conclude?

MS. WILLIAMSON: This is Alicia Williamson. Yes, we did evaluate the Park Service's concerns. As it was talked in one of the earlier panels, they were a cooperating agency on the EIS, so they did have - they worked with us as partners as we built the EIS.

I think that some of the, I guess I'll say differences of opinion, and why they may still have concerns stems from our various - they're more of a conservation agency while we are a regulatory agency.

In terms of examples of some of the things that we did do, specifically as a result of their comments on the DEIS, we actually went back and conducted an additional water modeling analysis as a

result of their concerns that came out of their DEIS comments.

Additionally, we also had many meetings with them, in person as well as on telecom, sometimes weekly, sometimes biweekly just depending on what phase of the review we were in, to discuss their concerns, but they were intimately involved with the production of the EIS.

COMMISSIONER BARAN: On an earlier panel, the staff referred to the National Park Service as having special expertise in this area. Isn't the National Park Service best positioned to assess the impacts on Biscayne National Park and Everglades National Park?

MS. WILLIAMSON: Yes, they did provide us input. They do have a direct knowledge that we were able to draw upon and use within our analysis within the EIS.

COMMISSIONER BARAN: And were they ultimately satisfied with the EIS analysis?

MS. WILLIAMSON: According to their December letter, they did still express concerns.

COMMISSIONER BARAN: Okay, so there wasn't anything after that in which they came back and said they were satisfied?

MS. WILLIAMSON: No.

COMMISSIONER BARAN: Okay, and then in another December 2016 comment to letter to the NRC, the EPA stated that it also, "has several environmental concerns that were not adequately addressed in the final EIS."

EPA indicated that its overriding environmental concerns stem from the fact that the existing facility is currently impacting an underground source of drinking water and that the plant expansion could, "potentially complicate or exacerbate existing environmental impact issues." Did the staff evaluate those concerns, and if so, what did you conclude?

MS. WILLIAMSON: Yes, the staff did also. We also worked with the Environmental Protection Agency Region IV in Atlanta. We met with them many times also over the course of the review and took their comments directly, particularly regarding the USDW.

For more specifics, I might want to ask one of the staff members from the audience to come and give us a little bit more detail on those EPA comments and some of the activities we conducted with EPA.

CHAIRMAN SVINICKI: And again, if you

would state your name, your organizational affiliation, and indicate whether or not you've been sworn as a witness?

MR. BARNHURST: Sure, my name is Daniel Barnhurst. I'm a hydrogeologist with NRO and I have been sworn in.

CHAIRMAN SVINICKI: Thank you.

MR. BARNHURST: And so as Ms. Williamson indicated, the concerns that were brought up from the EPA related to potential impact to water resources. Each of those concerns actually came to us in the form of comments and in person as we met with them throughout the process, and those are things that we evaluated in the EIS and documented in section 5-2 and 7-2.

And then as Ms. Williamson also indicated, there was additional modeling that was performed between the DEIS and the FEIS stage, and if you look at the FEIS, you can see change bars in the column indicating new text that was added between the DEIS and the FEIS. Much of that was added because of - in order to be responsive to the National Park Service and the EPA's concerns.

And so in the water section for instance, she indicated there was additional modeling that was

performed. That modeling was done to evaluate the Units 3 and 4, the issues that were occurring at the plant at that time with the hypersaline, the cooling canal system, the hypersaline plume that was moving into Biscayne from beneath the plant.

COMMISSIONER BARAN: Was EPA ultimately satisfied with that modeling and the final EIS?

MR. BARNHURST: I think their comment letter indicates that they still have concern. I do feel, you know, from a technical aspect, that we did fully evaluate that and we determined that the impact from the existing plant, or, excuse me, the proposed plants, 6 and 7, the impact that would occur, the nexus there between Units 6 and 7 and the site would be mainly the operation of radial collector wells which, again, would be limited.

And so as we evaluated the entire site and the changes in the baseline, that it occurred because of the hypersaline plume and some of the other issues there, mitigation measures that were proposed. As we evaluated that in the new model, we determined that those impacts would occur. They would be there regardless of whether or not Units 6 and 7 were built and that operation of the radial collector wells would not impact the water resources there.

COMMISSIONER BARAN: I'm kind of out of time, but is it fair to say that in the end, the NRC staff ultimately disagreed with the EPA and the National Park Service on this?

MS. WILLIAMSON: I would say that it is a difference of opinion, yes.

COMMISSIONER BARAN: Thank you.

CHAIRMAN SVINICKI: Thank you. Commissioner Burns, please proceed.

COMMISSIONER BURNS: Yes, one question I have, I think we've had, and I think Ms. Williamson may have alluded to it, is the question about whether we have looked or have identified any potential new and significant information that might require supplementation of the FEIS.

And I think in the response to question 58, staff indicated the only information considered was new information regarding a draft settlement between FP&L and the city of Miami that would lead to underground siting or underground extension of transmission lines.

We had a lot of discussion this morning with respect to the recent hurricane information, and I take it, and to some extent I am inferring from the testimony we received this morning, but I also would

like to hear from this panel and the environmental experts whether or not you considered any of the recent information from the aspects of the hurricanes that were recently experienced as potentially new and significant information in that area? Has the staff taken that into consideration?

MS. WILLIAMSON: We did not specifically take into account the recent series of hurricanes within our new and significant process, although we did examine and look at the potential of hurricanes as part of the environmental impact assessment.

COMMISSIONER BURNS: Okay, the other - another aspect I'd be interested in, in prehearing question 47, the Commission asked about potential license conditions discussed in a letter resulting from the consultation with the National Marine Fisheries Service.

In the response, it stated none of - the staff said none of the three items noted in the question would be addressed in the COLs if they were granted, but they did not say other than - it did not really explain why other than a note that the staff expected the Department of the Army permits would include these items. Is that how you would expect that would come out?

MR. DOUB: Yes, what we did with both the concurrence letter from the National Marine Fisheries Service and the incidental take statement from the Fish and Wildlife Service, we looked at the various requirements, identified each.

Some of them pertained to survey and reporting actions, and those are being included in our environmental protection plan which will actually be part of the license conditions, and others pertained to conservation measures that don't strictly fall under NRC's regulatory authority.

For those, the U.S. Army Corps of Engineers specifically agreed to include them as conditions to their Department of the Army permit that they will issue under the Clean Water Act.

COMMISSIONER BURNS: Is that because we would consider them preconstruction activities?

MR. DOUB: No, it's more what we have authority to enforce.

COMMISSIONER BURNS: Okay.

MR. DOUB: And if you need more details on that, I might refer you to a lawyer.

COMMISSIONER BURNS: Not this one. I don't want to argue with myself. Anyway, no, I appreciate, all kidding aside, I appreciate that

because I think what you note is that there is more than one regulatory agency or oversight body involved in the permitting of projects, you know, nuclear power plants as well as many other projects, so this is something where we've taken, as I understand your answer, we look at this as something within the purview of the Corps?

MR. KUGLER: Yes, sir.

COMMISSIONER BURNS: Okay, thank you. Thank you, Chairman.

CHAIRMAN SVINICKI: All right, well, I'd like to thank the panelists for the environmental panels, and if you will take your seats, I would ask the closing statement participants by the applicant and the NRC staff to please come up and take places at the table. We'll just take a brief moment here to reset for that purpose.

So as the staff take their seats, I will now offer each party the opportunity to make a closing statement, and we will begin with the applicant, FPL. Please proceed.

MR. MAHER: First, thank you, Commissioners for the time and effort that you put forth in preparing for and conducting this hearing. We appreciate your insights and questions, and ensure

that any follow-up information that you may want is addressed.

I would also like to recognize the work done by the NRC staff. I believe that this hearing has fully demonstrated the exhaustive review done by the staff and validates the staff's safety and environmental findings with about 120,000 hours of review by the NRC staff and contractors, or about 57 man-years worth of work.

We certainly agree with the conclusions that the AP 1000 is safe, the environmental considerations have been addressed, and the Commission has the information necessary to make the required findings for issuance of the Turkey Point COL.

I also want to recognize the professionalism and thoroughness of our FPL team in addressing the information needs and emergent issues required to complete the COLA review.

FPL, Bechtel, Westinghouse, Rizzo, and the rest of the Turkey Point 6 and 7 COLA team invested several hundred thousand man-hours to prepare the COL application and to complete the COLA review.

Despite the significant and unique challenges that we and others have faced in completing the COLA review, FPL fully supports the standard

design approach. We have benefitted from the lead plant applications, ongoing construction activities, and believe that our experience will also benefit subsequent applicants.

It should be no surprise that with a new design that there are emergent issues that must be addressed. We believe that the benefits of a certified and standard design will not be fully realized until completion of the first of a kind construction currently in progress.

Our work to address the emergent industry issues and AP 1000's specific issues has not reduced our confidence in the safety of the AP 1000 design and the significant value of passive safety systems.

Obtaining this Turkey Point COL is key to FPL's ability to meet generation and resource requirements. Our planning identifies base load generation needs that support the addition of the Turkey Point plant.

Having a COL minimizes construction risk and provides us the ability to implement 2200 megawatts of nuclear generation five to seven years faster than would otherwise be possible. These are significant strategic considerations in making a final decision on whether to move forward with a

multibillion dollar mega-project.

The company will make a final decision on new nuclear generation in Florida in the future based on, among other factors, energy needs, project costs, carbon regulation, natural gas prices, existing or future legislative provisions for cost recovery, and the requirements of the NRC's combined operating license.

Commissioners, thank you again for your efforts. We welcome any further questions you may have regarding the Turkey Point 6 and 7 combined license application.

CHAIRMAN SVINICKI: Thank you very much. I now invite the NRC staff to make its closing statement.

MS. ORDAZ: Thank you, Chairman. We thank you for the opportunity to speak today. In the staff's paper to the Commission pertaining to this mandatory hearing, the staff's final safety evaluation report, and the final environmental impact statement, and in our presentations to you during this hearing, we have provided an adequate basis for making the necessary finding set forth in 10 CFR 52.97 and 10 CFR 51.107 to support the issuance of the combined licenses for Turkey Points Units 6 and 7.

In this hearing, we've described why the staff's review of the Turkey Point Units 6 and 7 combined license application has been both thorough and complete. The review was appropriately focused by the finality afforded to issues within the scope of the AP 1000 design certification.

The staff has demonstrated the thoroughness of our review in part through its reliance on staff guidance and interactions with the ACRS. The ACRS agrees with the staff's conclusion that the combined licenses for Turkey Point Units 6 and 7 should be issued.

Today, we highlighted certain aspects of our safety and environmental reviews. During the staff's safety panel, we explained the staff's evaluation of storm surge and sea level rise and deep well injection for liquid radioactive waste disposal.

With regards to the low population density criterion discussed this morning, we would like to clarify for the record that it should have been 500 people per square mile as opposed to 500 people per square meter.

PARTICIPANT: Yeah.

MS. ORDAZ: During the staff's environmental panel, we discussed cooling water

sources, alternative sites, critical habitat in consultation with the U.S. Fish and Wildlife Service and the National Marine Fisheries Service. We also highlighted our process for compliance with the NRC's National Environmental Policy Act, regulations specified in 10 CFR Part 51, and other applicable environmental statutes, and appropriate interactions with other government agencies and the public.

We are similarly confident that through the ITAAC process, the construction reactor oversight process, inspections of construction activities, and oversight of the transition from construction to operation, we will be able to confirm that the plant has been constructed and will operate in conformance with the licenses, the Atomic Energy Act, and the Commission's regulations.

The applicant understands the necessity of complying with the requirements, and also understands what needs to be done if any noncompliance is discovered including determining the safety significance, determining operability, determining the extent of condition, and taking prompt corrective action to restore compliance.

In those instances in which we relied on commitments, we have done so in accordance with the

Commission's commitment policies and practices. We have verified that there is an established process by which the licensee maintains commitments and implements changes, and we of course oversee those changes if any are made. The staff appreciates the opportunity to present to the Commission today the results of our thorough and complete review.

And before I conclude my final remarks, I want to take a brief moment to reflect on our progress at implementing Part 52. This marks the eighth mandatory hearing and the last for a combined license application for a large light water reactor. We have learned much since the initial hearings for Vogtle and Summer, and have revised our internal procedures to reflect those lessons learned.

Because many of us here today may not be present for the next combined license mandatory hearing, we have undertaken efforts to institutionalize those best practices and internal staff documents, and are examining how best to retain those practices as the NRO and NRR merge in the near future. There's a specific working group under the merger efforts focused on KM activities.

I want to thank this moment to thank the current Commission and the past Commissioners for

their active engagement in the licensing process. Your questions have encouraged the staff to better explain its basis supporting licensing decisions and to be better able to articulate those bases in a public and transparent manner.

And finally, I want to publicly commend the tremendous staff from NRO and all of our supporting business lines who provided information today in this hearing and in past hearings. These individuals worked tirelessly every day to resolve the technical issues in support of the NRO mission. This concludes my remarks. Thank you, Chairman.

CHAIRMAN SVINICKI: Thank you very much, Vonna. I thank both the applicant and the staff for their closing statements. Before we proceed to Commissioners' closing remarks, I'd like to ask my fellow Commissioners if they have any questions associated with the closing statements by the parties or otherwise? Okay, seeing shaking of heads, I will now recognize Commissioner Baran for any closing remarks he'd like to make.

COMMISSIONER BARAN: I just want to thank the NRC staff and all of today's participants for your hard work throughout the review of this application and for your thorough preparation for today's hearing.

We really appreciate it. Thank you.

CHAIRMAN SVINICKI: Thank you. Commissioner Burns?

COMMISSIONER BURNS: I'll echo that, the same appreciation to the staff and the applicant for their preparation for today's hearing, and the testimony, as well as the answers to the questions that we've posed them.

I also want to acknowledge with respect to the NRC, the participation of sister agencies and organizations such as Oak Ridge National Laboratory, the Army Corps of Engineers, as well as the National Park Service, Fish and Wildlife Service, and the EPA. These are important, as I noted in my last question there. There are a lot of folks who are potentially involved to inform our decision making, so I want to express my appreciation to them as well as to the NRC staff. Thank you.

CHAIRMAN SVINICKI: Thank you. Before I close with some closing procedural matters, let me give my closing remarks as a member of the Commission and not as the Chairman presiding.

Vonna, I appreciate your remarks about the somewhat important milestone that we encounter here today for the Nuclear Regulatory Commission. Having

been here for the first of these mandatory hearings that were conducted in the modern era, and Frank is nodding his head, that felt very historic in that moment as well, and although there continues to be new reactors licensing work before the agency, it is true, and we should acknowledge that today's is the last COL mandatory hearing of those that we have contemplated.

The staff of NRO under leaders over the last, I would say, four or five years, have been pushing very, very hard, pushing the capable team of folks that you have in the New Reactors Office to get to this milestone today.

So as NRO and NRR prepare for a future new organizational structure where work on new reactors will continue to go on, but in a different organizational structure, I think that today is a significant milestone, so I commend you, and it's been a very long journey, and it's not just those of you sitting at the table here, but all of the folks here today, and the witnesses, and experts who contributed to previous reviews as well.

I also commend the applicant on a very vigorous and thorough defense of the application. You all have been engaged in a very long endeavor as well, and articulating it as 57 man-years of work makes - I

don't know. It makes me fatigued. I don't know about anybody else in this room. I'm tired just hearing that. That sounds like a really, really significant effort which indeed it was.

Also I want to acknowledge of course, as a Commission we can't successfully conduct these mandatory hearings without the able support of the Office of the Secretary, the Office of Commission Appellate Adjudication, and the Office of General Counsel, and all of those elements of the Office of Administration that support us, and all of the administrative support that each of us has in the work we do here day to day, so I thank them for that.

And I will now conclude with the important procedural matters for the parties who aren't off the hook yet, so in closing and for the information of the parties, the deadline for responses to any post-hearing questions will be January 9, 2018 unless the Commission directs otherwise.

The secretary plans to issue an order with post-hearing questions, if any, by December 19, 2017. The deadline for transcript corrections will be January 9. The secretary plans to issue an order requesting proposed transcript corrections by December 18.

As I mentioned this morning in my opening, the Commission expects to issue a final decision promptly with due regard to the complexity of the issues. With that, the hearing is adjourned. Thank you.

(Whereupon, the above-entitled matter went off the record at 2:43 p.m.)

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

In the Matter of	)	
	)	
FLORIDA POWER & LIGHT COMPANY	)	Docket Nos. M-52-040 and 52-041-COL
(Juno Beach, Florida)	)	
	)	
(Turkey Point, Units 6 & 7)	)	

CERTIFICATE OF SERVICE

I hereby certify that copies of the foregoing **ORDER (Setting Deadline for Proposed Transcript Corrections)** have been served upon the following persons by Electronic Information Exchange.

U.S. Nuclear Regulatory Commission
Office of Commission Appellate Adjudication
Mail Stop: O-16B33
Washington, DC 20555-0001
ocaamail@nrc.gov

U.S. Nuclear Regulatory Commission
Office of the Secretary of the Commission
Mail Stop: O-16B33
Washington, DC 20555-0001
hearingdocket@nrc.gov

U.S. Nuclear Regulatory Commission
Office of the General Counsel
Mail Stop: O-15 D21
Washington, DC 20555-0001

Patrick Moulding, Esq.
patrick.moulding@nrc.gov
Maxine R. Segamick, Esq.
Maxine.Segamick@nrc.gov
Robert Weisman, Esq.
robert.weisman@nrc.gov
Anthony C. Wilson, Esq.
anthony.wilson@nrc.gov
Megan Wright, Esq.
Megan.wright@nrc.gov
Susan Vrahoretis, Esq.
susan.vrahoretis@nrc.gov

Florida Power & Light Company
700 Universe Blvd.
Juno Beach, Florida 33408
Nextera Energy Resources
William Blair, Esq.
william.blair@fpl.com

Florida Power & Light Company
801 Pennsylvania Ave. NW Suite 220
Washington, DC 20004
Steven C. Hamrick, Esq.
steven.hamrick@fpl.com

Pillsbury, Winthrop, Shaw, Pittman, LLP
1200 Seventeenth Street, N.W.
Washington, DC 20036-3006

Anne Leidich, Esq.
ann.leidich@pillsburylaw.com
David R. Lewis, Esq.
david.lewis@pillsburylaw.com
Michael G. Lepre, Esq.
michael.lepre@pillsburylaw.com
Timothy J. V. Walsh, Esq.
timothy.walsh@pillsburylaw.com

[Original signed by Brian Newell]
Office of the Secretary of the Commission

Dated at Rockville, Maryland,
this 18th day of December, 2017.